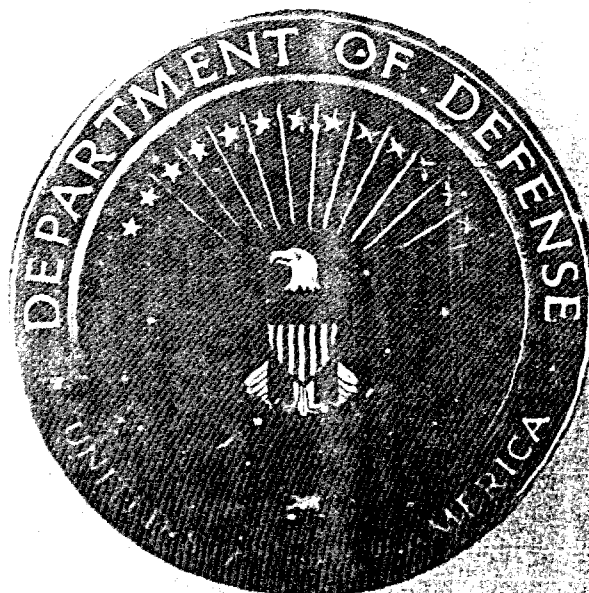


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DEPARTMENT OF DEFENSE IN-HOUSE RDT&E ACTIVITIES



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Management Analysis Report for Fiscal Year 1990

Department of the Army

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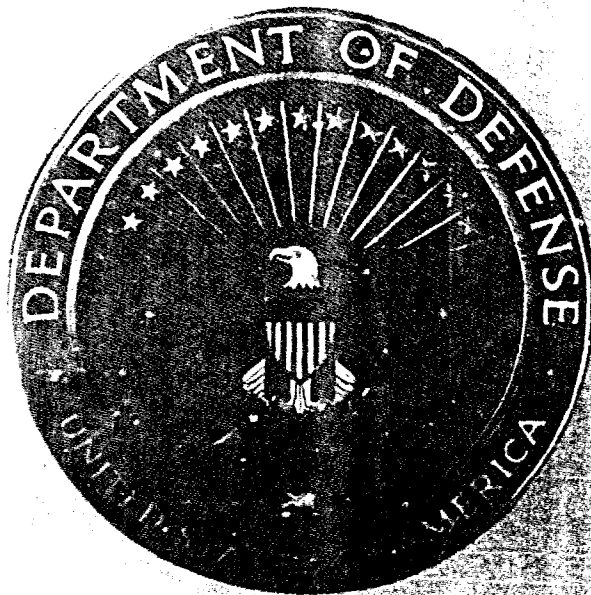
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DEPARTMENT OF DEFENSE IN-HOUSE RDT&E ACTIVITIES



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Management Analysis Report for Fiscal Year 1990

Department of the Army

Department of the Navy

Department of the Air Force

Defense Nuclear Agency

ERRATA

Department of Defense In-House RDT&E Activities Report for FY 1990

Page VI: SUMMARY, DoD IN-HOUSE RDT&E ACTIVITIES (INCLUDING LABORATORIES, EXCLUDING RESEARCH OFFICES). Four of the five dollar amounts in the block headed PROGRAM DATA FOR FY 1990 are incorrect. That block should appear as shown below:

PROGRAM DATA FOR FY 1990 (MILLIONS \$)	
TOTAL ANNUAL PROGRAM	13,416.796
TOTAL IN-HOUSE PROGRAM	6,783.531
TOTAL RDT&E PROGRAM	8,533.092
TOTAL IN-HOUSE RDT&E	4,044.805
TOTAL ANNUAL OPERATING COST	1,549.884

Page VIII: TABLE 1, ARMY RDT&E ACTIVITIES, PROGRAM AND PERSONNEL DATA FY 1990. The amounts under FUNDING DATA (MILLIONS \$), (i.e., TOTAL, TOTAL IN-HOUSE, TOTAL RDT&E, IN-HOUSE RDT&E) for White Sands Missile Range and for the Table TOTALS are incorrect. They should be as shown below (Note: Yuma Proving Ground appears below to maintain continuity in the Table):

White Sands Missile Range	240.876	154.150	156.196	112.433
Yuma Proving Ground	121.916	71.328	82.913	40.883
TOTALS:	4,002.426	1,968.970	2,622.753	1,244.356

Page 47: WHITE SANDS MISSILE RANGE. Half of the amounts shown in the PROGRAM DATA BY FISCAL YEAR (MILLIONS \$) block at the top of the page are incorrect. That block should appear as shown below:

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	156.196	155.390
TOTAL PROCUREMENT	25.527	26.538
TOTAL O&M	6.510	6.806
TOTAL OTHER	52.643	31.249
TOTAL ANNUAL LAB	240.876	219.983
TOTAL INHOUSE	154.150	132.723
TOTAL INHOUSE RDT&E	112.433	111.818
ANNUAL OPERATING COST	0.000	0.000

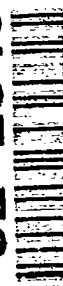
DEPARTMENT OF DEFENSE IN-HOUSE RDT&E ACTIVITIES REPORT

for
Fiscal Year 1990

Prepared for:

The Office of the Secretary of Defense
Office of the Deputy Director of Defense
Research and Engineering/Science and Technology
The Pentagon
Washington, DC 20301

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FOREWORD

This report was prepared by the Office of the Secretary of Defense. This edition is a continuation of the series of reports initiated in 1966.

All current DoD RDT&E Activities which meet the report requirement of having at least 25 percent of their budget in RDT&E Funds are listed alphabetically within their military department. Some facilities which do not meet the 25 percent requirement are also listed by special request.

Each In-House Research, Development, Test and Evaluation (RDT&E) Activity of the Department of Defense is described on one page in this compilation. The data for FY90 are summarized in tables preceding the main text.

Organizational changes during FY 1990 appear in Appendix I. Appendix II contains definitions of the data elements displayed in this report and contained in the database. Appendix III defines selected abbreviations and acronyms. Appendix IV lists selected key words with page references.

DoD Instruction 7700.9, which has been the basis of this report since its inception, was replaced by a tri-service regulation, AR 70-63 NAVCOMPTIST, 7044.5E, AFR 80-26, DNA 7700.9A, entitled DoD In-House RDT&E Annual Activities Report, 1 September 1981.

Every effort has been made to provide accurate information, particularly fiscal and personnel data. All numbers and statements submitted by each listed organization have been thoroughly examined.

Considerably more data is accumulated in a computerized database than is published in this report. All data is used by numerous organizations such as the Department of Defense, Office of Technology Assessment, DoD Audit Agency, various committees of the Congress, and the General Accounting Office, among others. The availability of this report and its underlying database allow timely and accurate information to be provided without continual recourse to the appropriate field activity.

This publication should be given widespread distribution in the DoD Laboratories as an internal management document at the Director and Commanding Officer level as well as at the bench level, in order to allow personnel an opportunity to familiarize themselves with the functional capabilities of other DoD Laboratories. By this means laboratory scientists and engineers can be encouraged to communicate with each other on common problems of interest to their service laboratories as well as to communicate with laboratories of the other services.

Additional copies of this document may be obtained by writing to the following addresses:

Office of the Secretary of Defense
Deputy Director of Defense
Research and Engineering/Science and Technology (BRH)
The Pentagon
Room 3E118
Washington, DC 20301-3080

or

I-NET, Inc
ATTN: CSG-8920
6430 Rockledge Drive
Suite 600
Bethesda, MD 20817
(301) 564-6712

Statement A per telecon Bob Wolownik
OSD/DDD-R&T SNI-RLM The Pentagon
Washington, DC 20301-3080
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BRIEF EXPLANATION OF HEADINGS

Note: This report does not reflect the total DoD RDT&E program. It is not a budgetary document. It is a management summary covering only "RDT&E Activities", which are: (1) those Activities where In-House RDT&E funding is at least 25 % of the In-House portion of the Activity's total annual budget, and (2) other RDT&E Activities where inclusion in this report has been requested (e.g., the Services' Research Offices).

ANNUAL PROGRAM - The sum of the Appropriations for RDT&E, Procurement, O&M and "Other" for the Activities covered by the individual Summary pages (i.e., RDT&E Activities, page VI; R&D Laboratories, page XVI; Service Research Offices, page XXIV).

RDT&E - Obligational authority, regardless of source, for both In-House and Out-of-House Appropriations for the following categories: research (6.1), exploratory development (6.2), advanced development (6.3), engineering development (6.4), management support (6.5), operational systems support (6.6/6.7), and non-DoD funds.

PROCUREMENT - The obligational authority for both In-House and Out-of-House Procurement Appropriations, regardless of source.

O&M - The obligational authority for both In-House and Out-of-House Operations and Maintenance Appropriations, regardless of source.

OTHER - The obligational authority for both In-House and Out-of-House Appropriations, regardless of source, which are not reported elsewhere; may include military pay and allowances and military construction.

IN-HOUSE PROGRAM - The sum of only the In-House portions of Appropriations for RDT&E, Procurement, O&M and "Other". "In-House" is work performed directly by an Activity's own personnel.

ANNUAL OPERATING COST - A summary of the overhead costs for operating one or more Activities (including laboratories and research offices). It includes costs such as utilities, rents, janitorial services, guard and fire protection, support services such as supply personnel, printing, maintenance of buildings and grounds, etc. It does not include the salaries of direct labor personnel such as scientists, engineers, technicians, craftsmen, machinists, etc.

PROFESSIONAL (PERSONNEL) - Full-time government scientific and engineering personnel actively engaged in RDT&E Activities; including personnel with PhD's.

NON-PROFESSIONAL (PERSONNEL) - All assigned personnel other than those defined above as "professionals".

SPACE - This data includes only walled and roofed building space. It does not include such things as parking lots, open storage areas, lean-tos, etc.

REAL PROPERTY COST - Each reporting Activity is responsible for determining and reporting the cost of real property. This also includes the cost of installed physical plant equipment such as HVAC.

EQUIPMENT COST - Each reporting Activity is responsible for determining and reporting the cost of personal property. This also includes the cost of installed equipment directly related to mission execution, such as lab test equipment.

TOTAL ANNUAL LAB BUDGET - The sum of Total RDT&E, Total Procurement, Total O&M and Total Other for a single Activity (i.e., laboratory, research office or other Activity).

SUMMARIES

AND

TABLES

SUMMARY
DEPARTMENT OF DEFENSE IN-HOUSE RDT&E ACTIVITIES
(INCLUDING LABORATORIES, EXCLUDING RESEARCH OFFICES)

PROGRAM DATA FOR FY 1990 (MILLIONS \$)	
TOTAL ANNUAL PROGRAM	13,296.589
TOTAL IN-HOUSE PROGRAM	6,667.171
TOTAL RDT&E PROGRAM	8,416.785
TOTAL IN-HOUSE RDT&E	3,928.498
TOTAL ANNUAL OPERATING COST	1,549.884

PERSONNEL DATA (END OF FY 1990)			
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROFESSIONAL
MILITARY	28,193	641	9,085
CIVILIAN	72,436	4,097	36,438
TOTAL	100,629	4,738	45,523

PHYSICAL FACILITIES (END OF FY 1990)	
ACRES	7,193,120
SPACE (THOUSANDS OF SQUARE FEET)	
LABORATORY	34,590.068
ADMINISTRATIVE	10,576.813
OTHER	50,706.302
TOTAL	95,873.183
COST (MILLIONS \$)	
REAL PROPERTY	8,213.501
EQUIPMENT	6,894.105
TOTAL	15,107.606

TABLE 1. ARMY RDT&E ACTIVITIES, PROGRAM AND PERSONNEL DATA, FY 1990

INSTALLATION	FUNDING DATA (MILLIONS \$)				PERSONNEL DATA							
	TOTAL	TOTALS		TOTALS	IN-HOUSE RDT&E	IN-HOUSE RDT&E	TOTAL MIL	TOTAL CIV	PHD MIL	PHD CIV	PROF MIL	PROF CIV
		IN-HOUSE	RDT&E									
Aeromedical Research Laboratory	12.410	9.503	9.087	6.180	6.180	6.180	67	67	15	14	42	21
Airworthiness Qualification Test Directorate	8.430	7.438	8.064	7.173	7.173	7.173	52	98	0	0	27	29
Armament Research, Develop. & Engr. Center	455.800	250.800	240.300	132.000	132.000	132.000	79	3,916	0	87	66	2,061
Atmospheric Sciences Laboratory	37.387	18.703	37.336	18.652	18.652	18.652	3	370	0	31	3	174
Aviation Systems Command	82.660	50.243	71.221	43.740	43.740	43.740	18	530	1	34	16	303
Aviation Technical Test Center	27.654	27.654	12.283	12.283	12.283	12.283	83	89	0	0	18	34
Avionics Research & Development Activity	23.189	13.576	16.615	10.634	10.634	10.634	10	203	0	4	3	153
Ballistic Research Laboratory	39.634	26.607	26.672	18.831	18.831	18.831	16	720	0	122	7	444
Belvoir Research, Develop. & Engr. Center	125.848	43.680	108.091	31.192	31.192	31.192	46	890	0	27	17	496
Biomedical Research & Development Lab	11.269	9.986	9.960	8.677	8.677	8.677	26	93	4	15	23	45
Center for Cmd, Control, and Communications	84.339	20.673	53.467	13.043	13.043	13.043	14	324	0	10	4	236
Center for Electronic Warfare/RSTA	213.081	19.236	49.855	11.304	11.304	11.304	37	274	0	8	3	190
Center for Night Vision & Electro-Optics	134.857	40.453	101.369	31.624	31.624	31.624	28	471	0	44	4	330
Center for Signals Warfare	83.771	16.365	62.375	14.664	14.664	14.664	35	194	0	2	6	119
Chemical Research, Develop. & Engr. Center	275.128	102.080	199.588	74.372	74.372	74.372	95	1,251	8	80	40	638
Cold Regions Research & Engineering Lab	27.753	23.550	16.921	14.890	14.890	14.890	8	308	0	39	7	128
Cold Regions Test Center	12.044	12.044	5.111	5.111	5.111	5.111	88	32	0	0	13	10
Combat Systems Test Activity	117.016	79.101	70.106	46.955	46.955	46.955	228	1,188	0	8	49	435
Construction Engineering Research Lab	56.961	33.408	41.258	25.217	25.217	25.217	3	332	0	40	3	214
Dugway Proving Ground	78.643	49.477	49.892	28.773	28.773	28.773	126	649	0	17	22	103
Electronic Proving Ground	61.758	33.246	28.967	11.718	11.718	11.718	569	227	0	2	68	133
Electronics Technology and Devices Lab	88.567	21.662	81.794	19.403	19.403	19.403	1	301	0	42	1	227
Engineer Topographic Laboratories	91.715	22.061	76.577	14.574	14.574	14.574	12	383	1	19	6	254
Engineer Waterways Experimentation Station	139.655	83.248	61.367	36.575	36.575	36.575	21	517	3	137	13	722
Harry Diamond Laboratories	103.950	57.972	83.480	44.307	44.307	44.307	3	673	0	42	1	402

TABLE 1. ARMY RDT&E ACTIVITIES, PROGRAM AND PERSONNEL DATA, FY 1990

INSTALLATION	FUNDING DATA (MILLIONS \$)				PERSONNEL DATA							
	TOTAL	TOTALS		IN-HOUSE RDT&E	TOTALS RDT&E	IN-HOUSE RDT&E	TOTAL MIL	TOTAL CIV	PHD MIL	PHD CIV	PROF MIL	PROF CIV
		IN-HOUSE										
Human Engineering Laboratory	24,011	15,030	23,263	14,291			31	221	3	19	14	130
Institute of Dental Research	7,410	5,679	5,063	3,332			58	18	16	3	39	7
Institute of Surgical Research	11,988	11,988	5,575	5,575			153	78	17	4	56	23
Letterman Army Institute of Research	20,696	16,242	14,097	9,645			113	107	41	20	96	62
Materials Technology Laboratory	37,049	23,919	33,851	22,321			7	529	1	67	5	236
Material Systems Analysis Activity	47,226	27,945	33,250	22,834			28	432	0	12	14	379
Medical Materiel Development Activity	40,209	5,276	38,711	3,778			20	36	8	8	15	14
Medical Research & Development Command	30,977	12,040	18,423	6,203			60	184	18	4	54	27
Medical Research Inst. of Chemical Defense	30,619	22,238	26,271	17,890			81	208	15	34	43	104
Medical Research Inst. of Infectious Diseases	61,531	38,682	49,719	26,870			285	282	52	42	107	114
Missile Research, Develop. & Engr. Center	289,463	79,898	219,538	61,558			81	1,707	0	58	36	1,215
Natick Research, Develop. & Engr. Center	115,151	73,056	75,339	40,225			820	901	2	56	36	405
Research Inst. of Behavioral & Social Sciences	69,524	26,348	66,515	24,137			16	313	1	146	16	193
Research Inst. of Environmental Medicine	10,856	10,046	8,016	7,206			76	92	17	29	30	51
Tank Automotive RD&E Center	95,909	37,854	64,460	19,301			31	869	1	22	19	492
TRADOC Test and Experimentation Command	177,504	162,504	57,226	57,226			1,398	904	0	1	195	231
Vulnerability Assessment Laboratory	67,518	19,924	42,240	17,804			61	247	0	5	12	147
Walter Reed Army Institute of Research	108,474	73,057	80,371	49,954			383	413	98	69	357	260
White Sands Missile Range	140,876	54,150	56,196	32,433			571	2371	15	62	507	1161
Yuma Proving Ground	121,916	71,328	82,913	40,883			294	951	0	3	170	158
TOTALS:	3,902,426	1,868,970	2,522,793	1,144,356			6,235	24,963	337	1,488	2,283	13,310

TABLE 2. ARMY RDT&E ACTIVITIES, FACILITY DATA, FY 1990

TABLE 2. ARMY RDT&E ACTIVITIES, FACILITY DATA, FY 1990									
INSTALLATION	LOCATION	ACRES	SPACE AND PROPERTY					COST (MILLIONS \$)	
			SPACE (THOUSANDS OF SQUARE FEET)			TOTAL	REAL PROP.		EQUIP.
			LAB	ADMIN	OTHER				
Aeromedical Research Laboratory	Ft. Rucker, AL	53	99,286	17,520	39,652	156,458	8,256	35,361	
Airworthiness Qualification Test Directorate	Edwards AFB, CA	33,518	9,200	16,000	124,000	149,200	4,725	45,263	
Armament Research, Develop. & Engr. Center	Picatinny Arsenal, NJ	6,487	267,806	1,013,046	2,747,397	4,028,249	139,355	326,700	
Atmospheric Sciences Laboratory	White Sands Msl Rng, NM	15	40,531	81,312	18,549	140,392	2,608	35,601	
Aviation Systems Command	St Louis, MO	127	88,848	58,673	16,370	163,891	2,350	17,106	
Aviation Technical Test Center	Ft. Rucker, AL	1,196	1,900,000	52,320	121,263	2,073,583	2,124	0,798	
Avionics Research & Development Activity	Ft. Monmouth, NJ	2	54,000	10,000	13,350	77,350	0,000	14,426	
Ballistic Research Laboratory	Aberdeen PG, MD	2,005	518,189	137,008	217,377	874,574	28,600	138,400	
Belvoir Research, Develop. & Engr. Center	Ft. Belvoir, VA	1,052	433,533	270,281	84,902	788,716	20,238	37,451	
Biomedical Research & Development Lab	Ft. Detrick, MD	5	74,929	29,090	9,462	113,481	4,703	8,606	
Center for Cmd, Control, and Communications	Ft. Monmouth, NJ	0	58,000	50,000	4,000	112,000	0,000	13,744	
Center for Electronic Warfare/RSTA	Ft. Monmouth, NJ	225	70,744	90,037	0,000	160,781	0,000	0,000	
Center for Night Vision & Electro-Optics	Ft. Belvoir, VA	0	30,000	44,473	37,000	111,473	12,244	60,238	
Center for Signals Warfare	Warrenton, VA	0	11,535	54,579	0,000	66,114	2,937	8,272	
Chemical Research, Develop. & Engr. Center	Aberdeen PG, MD	3,471	804,483	393,785	394,781	1,593,049	54,098	97,386	
Cold Regions Research & Engineering Lab	Hanover, NH	31	107,941	68,697	134,442	311,080	21,643	19,106	
Cold Regions Test Center	Ft. Greely, AK	125,475	0,000	35,432	129,204	164,636	17,889	15,187	
Combat Systems Test Activity	Aberdeen PG, MD	43,511	116,971	154,748	886,522	1,158,241	32,587	195,919	
Construction Engineering Research Lab	Champaign, IL	31	58,800	113,000	27,710	199,510	8,200	30,301	
Dugway Proving Ground	Dugway, UT	802,724	125,603	181,544	2,133,288	2,440,435	93,000	69,400	
Electronic Proving Ground	Ft. Huachuca, AZ	34,345	239,909	18,500	1,448	259,857	21,738	18,772	
Electronics Technology and Devices Lab	Ft. Monmouth, NJ	0	92,040	47,000	2,000	141,040	0,000	6,340	
Engineer Topographic Laboratories	Ft. Belvoir, VA	0	121,772	9,749	36,998	168,519	22,400	15,010	

TABLE 2. ARMY RDT&E ACTIVITIES, FACILITY DATA, FY 1990

INSTALLATION	LOCATION	SPACE AND PROPERTY					
		ACRES	SPACE (THOUSANDS OF SQUARE FEET)			COST (MILLIONS \$)	
			LAB	ADMIN	OTHER	TOTAL	REAL PROP. EQUIP.
Engineer Waterways Experimentation Station	Vicksburg, MS	3,073	1,798.808	353.645	176.809	2,329.262	60.141 66.700
Harry Diamond Laboratories	Adelphi, MD	2,316	503.364	12.053	121.717	637.134	56.111 62.223
Human Engineering Laboratory	Aberdeen PG, MD	72	111.524	7.056	21.400	139.980	14.000 26.000
Institute of Dental Research	Washington, DC	0	18.170	5.696	1.200	25.066	0.000 6.113
Institute of Surgical Research	Ft. Sam Houston, TX		26.424	1.800	22.400	50.624	6.958 6.542
Letterman Army Institute of Research	Presidio, SF, CA		128.960	56.941	138.700	324.601	52.353 15.768
Materials Technology Laboratory	Watertown, MA	48	424.773	42.011	22.133	488.917	27.132 4.543
Matériel Systems Analysis Activity	Aberdeen PG, MD	4	8.140	1.276	1.715	11.131	2.870 2.500
Medical Materiel Development Activity	Ft. Detrick, MD	0	0.00	12.864	0.220	13.084	0.532 0.104
Medical Research & Development Command	Ft. Detrick, MD	0	0.000	39.000	0.000	39.000	1.800 3.800
Medical Research Inst. of Chemical Defense	Aberdeen PG, MD	31	40.246	29.145	95.029	164.420	9.548 20.852
Medical Research Inst. of Infectious Diseases	Ft. Detrick, MD	388	104.136	26.618	205.841	336.595	21.430 33.190
Missile Research, Develop. & Engr. Center	Redstone Arsenal, AL	15,000	868.000	322.000	210.000	1,400.000	240.000 302.000
Natick Research Develop. & Engr. Center	Natick, MA	174	354.428	114.463	343.336	812.227	29.932 10.646
Research Inst. of Behavioral & Social Sciences	Alexandria, VA	0	53.355	14.000	6.100	73.455	0.807 3.829
Research Inst. of Environmental Medicine	Natick, MA	0	38.454	5.960	33.750	78.164	4.084 11.647
Tank Automotive RD&E Center	Warren, MI	11	246.562	23.756	125.274	395.592	278.159 163.516
TRADOC Test and Experimentation Command	Ft. Hood, TX	22	19.900	41.000	0.000	60.900	6.300 3.000
Vulnerability Assessment Laboratory	White Sands Msl Rng, NM	1,316	86.737	49.491	99.332	235.560	11.923 104.000
Walter Reed Army Institute of Research	Washington, DC	37	311.100	58.400	73.300	442.800	12.293 37.961
White Sands Missile Range	White Sands, NM	2,622,967	1,454.443	676.956	3,048.239	5,179.638	310.972 370.352
Yuma Proving Ground	Yuma, AZ	837,803	7.616	155.772	1,655.797	1,819.185	83.066 208.244
TOTALS:		4,537,545	11,929.260	4,996.697	13,584.007	30,509.964	1,729.206 2,692.907

TABLE 3. NAVY RDT&E ACTIVITIES, PROGRAM AND PERSONNEL DATA, FY 1990												
INSTALLATION	FUNDING DATA (MILLIONS \$)					PERSONNEL DATA						
	TOTAL	TOTALS		TOTALS		TOTAL	TOTAL		PHD	PROF		PROF
		IN-HOUSE	RDT&E	IN-HOUSE	RDT&E		MIL	CIV		MIL	CIV	
Aerospace Medical Research Laboratory	5,341	5,341	5,341	5,341	5,341	38	56	10	14	18	32	
Air Development Center	437,909	199,966	303,454	197,487	197,487	212	2615	4	76	54	1,591	
Air Propulsion Center	64,159	47,391	52,685	33,609	33,609	7	740	0	1	7	227	
Air Test Center	498,818	276,510	225,314	144,201	144,201	1,420	2,800	2	7	259	980	
Biodynamics Laboratory	3,416	3,288	3,226	3,226	3,226	40	41	3	4	10	14	
Civil Engineering Laboratory	56,508	29,554	25,402	19,164	19,164	16	400	0	24	6	236	
Clothing & Textile Research Facility	3,755	3,606	1,335	1,048	1,048	1	62	0	1	0	44	
Coastal Systems Center	197,780	108,450	123,559	73,973	73,973	91	1,295	0	58	10	747	
David Taylor Research Center	404,383	196,085	273,577	133,368	133,368	62	2,753	2	122	41	1,536	
Dental Research Institute	2,177	1,329	1,329	1,329	1,329	22	15	6	3	9	6	
Explosive Ordnance Disposal Tech Center	80,419	30,559	59,847	20,421	20,421	72	247	0	1	11	70	
Health Research Center	5,709	4,405	5,709	4,405	4,405	25	61	4	15	13	36	
Medical Research Institute	26,111	18,900	25,970	18,759	18,759	251	205	49	34	93	119	
Medical Research Unit No. 2	4,008	4,008	3,717	3,717	3,717	16	101	2	2	8	41	
Medical Research Unit No. 3	7,511	5,934	5,890	5,890	5,890	35	213	7	22	13	80	
Naval Research Laboratory	650,706	286,585	388,653	194,765	194,765	116	3,479	4	768	30	2,393	
Ocean Systems Center	582,895	365,163	368,794	163,859	163,859	254	3,078	0	196	208	1,626	
Oceanographic & Atmospheric Research Lab	67,560	55,283	61,607	35,256	35,256	24	487	1	95	15	371	
Ordnance Missile Test Station	14,969	4,265	9,783	1,716	1,716	79	78	0	0	24	21	
Pacific Missile Test Center	709,504	496,653	236,711	165,698	165,698	1,103	4,332	0	14	415	1,380	
Personnel Research & Development Center	29,047	17,791	18,381	11,195	11,195	25	277	0	71	15	221	
Submarine Medical Research Laboratory	4,513	3,474	4,513	3,474	3,474	31	43	6	10	11	26	
Surface Warfare Center	720,681	357,451	343,498	186,232	186,232	106	5,098	0	229	40	2,687	
Underwater Systems Center	662,331	324,066	312,860	158,823	158,823	88	3,569	1	103	83	2,174	
Weapons Center	802,856	408,281	424,936	247,565	247,565	491	5,275	0	167	23	2,112	
Weapons Evaluation Facility	10,839	9,361	5,359	4,918	4,918	105	136	0	0	11	37	
TOTALS:	6,053,905	3,263,699	3,291,453	1,839,439	1,839,439	4,730	37,456	101	2,037	1,427	18,807	

TABLE 4. NAVY RDT&E ACTIVITIES. FACILITY DATA, FY 1990

TABLE 4. NAVY RDT&E ACTIVITIES. FACILITY DATA, FY 1990								
INSTALLATION	LOCATION	ACRES	SPACE AND PROPERTY				COST (MILLIONS \$)	
			SPACE (THOUSANDS OF SQUARE FEET)				REAL PROP.	EQUIP.
			LAB	ADMIN	OTHER	TOTAL		
Aerospace Medical Research Laboratory	Pensacola, FL	1	94.040	6.289	19.672	120.001	11.083	10.140
Air Development Center	Warminster, PA	839	887.070	103.833	457.341	1,444.244	56.389	158.348
Air Propulsion Center	Trenton, NJ	68	488.390	27.962	92.816	609.168	52.800	13.400
Air Test Center	Patuxent River, MD	6,889	1,239.290	448.755	4,276.567	6,904.612	1,445.777	162.291
Biodynamics Laboratory	New Orleans, LA	1	25.845	23.149	1.276	50.270	0.000	2.271
Civil Engineering Laboratory	Port Hueneme, CA	32	105.322	67.893	47.785	221.000	6.300	9.200
Clothing & Textile Research Facility	Natick, MA	0	12.660	16.000	5.630	34.290	2.000	2.000
Coastal Systems Center	Panama City, FL	648	454.533	67.264	392.155	913.782	76.376	36.996
David Taylor Research Center	Bethesda, MD	419	1,748.000	120.000	287.000	2,155.000	86.275	124.800
Dental Research Institute	Gr. at Lakes, IL	1	21.264	6.001	9.318	36.583	0.000	1.746
Explosive Ordnance Disposal Tech Center	Indian Head, MD	1,087	148.416	166.992	0.000	315.408	80.401	0.000
Health Research Center	San Diego, CA	1	19.032	7.159	0.000	26.211	0.000	2.448
Medical Research Institute	Bethesda, MD	7	115.684	36.664	45.259	197.607	7.063	14.784
Medical Research Unit No. 2	Manila, Philippines	1	16.892	10.990	4.148	32.030	0.500	2.900
Medical Research Unit No. 3	Cairo, Egypt	3	82.822	8.862	55.602	147.286	26.750	2.372
Naval Research Laboratory	Washington, DC	0	2,799.564	196.463	438.769	3,434.796	165.600	151.700
Ocean Systems Center	San Diego, CA	2,319	1,393.218	204.025	205.657	1,802.900	73.400	190.200
Oceanographic & Atmospheric Research Lab	Stennis Space Center, MS	0	127.963	28.268	65.096	221.327	14.456	59.970
Ordnance Missile Test Station	White Sands, NM	95	114.086	50.916	34.795	199.797	6.775	8.111
Pacific Missile Test Center	Point Mugu, CA	27,093	1,387.261	485.121	3,502.588	5,374.970	224.922	555.482
Personnel Research & Development Center	San Diego, CA	3	75.320	18.417	0.000	91.737	1.900	12.899
Submarine Medical Research Laboratory	Groton, CT	1	40.514	14.099	0.000	54.613	0.000	2.380
Surface Warfare Center	Dahlgren, VA	5,084	1,595.169	316.958	1,345.213	3,257.340	157.000	378.330
Underwater Systems Center	Newport, RI	965	1,416.416	331.660	872.527	2,620.603	146.217	139.107
Weapons Center	China Lake, CA	1,123,135	2,468.842	315.364	2,763.296	5,547.502	328.014	167.161
Weapons Evaluation Facility	Albuquerque, NM	7	23.000	34.000	99.000	156.000	0.970	2.913
TOTALS:		1,168,699	16,934.463	3,113.104	15,021.510	35,069.077	2,970.979	2,211.949

TABLE 5. AIR FORCE RDT&E ACTIVITIES, PROGRAM AND PERSONNEL DATA, FY 1990												
INSTALLATION	FUNDING DATA (MILLIONS \$)				PERSONNEL DATA							
	TOTAL	TOTALS IN-HOUSE	TOTALS RDT&E	IN-HOUSE RDT&E	TOTAL MIL	TOTAL CIV	PHD MIL	PHD CIV	PROF MIL	PROF CIV		
Aero Propulsion and Power Laboratory	173.254	25.511	171.274	23.531	45	318	4	30	40	229		
Aerospace Medical Research Laboratory	41.412	8.662	36.516	8.659	110	164	15	31	42	98		
Air Force Development Center	397.044	336.554	151.769	97.132	9,969	906	13	2	1,776	255		
Armament Laboratory	130.793	35.396	130.677	35.280	107	394	3	15	80	263		
Arnold Engineering Development Center	294.378	211.400	231.168	161.818	147	270	1	7	80	93		
Astronautics Laboratory	132.000	40.127	132.000	40.127	137	294	4	24	65	168		
Avionics Laboratory	197.019	27.897	192.694	23.572	88	400	0	17	77	321		
Electronic Technology Laboratory	44.256	7.759	43.419	6.922	19	124	2	13	17	93		
Engineering and Services Laboratory	40.502	8.630	15.964	3.397	39	44	6	8	40	36		
Flight Dynamics Laboratory	169.653	47.986	161.575	39.908	113	543	4	33	87	390		
Flight Test Center	484.699	306.128	276.408	141.807	3,723	2,615	48	21	2,090	626		
Frank J. Seiler Research Laboratory	3.055	3.055	1.564	1.564	23	9	12	2	14	2		
Geophysics Laboratory	111.890	42.156	107.436	37.982	103	452	3	96	40	241		
Human Resources Laboratory	50.900	13.238	49.409	13.212	162	208	4	47	80	119		
Materials Laboratory	185.648	26.119	183.707	24.178	380	247	4	57	39	199		
Rome Air Development Center	364.995	62.563	297.940	46.181	177	1,069	8	63	117	626		
School of Aerospace Medicine	52.306	43.601	24.399	15.694	313	270	42	44	86	109		
Weapons Laboratory (AFSC)	273.731	143.213	248.795	118.277	479	559	28	61	367	249		
4950th Test Wing	125.801	97.281	95.958	67.569	847	829	1	0	152	142		
6585 Test Group	66.922	47.226	49.867	37.893	247	302	1	1	86	62		
TOTALS:	3,340,258	1,534,502	2,602,539	944,703	17,223	10,017	203	572	5,375	4,321		

TABLE 6. AIR FORCE RDT&E ACTIVITIES, FACILITY DATA, FY 1990									
INSTALLATION	LOCATION	ACRES	SPACE AND PROPERTY				COST (MILLIONS \$)		
			SPACE (THOUSANDS OF SQUARE FEET)			TOTAL	REAL PROP.	EQUIP	
			LAB	ADMIN	OTHER				
Aero Propulsion and Power Laboratory	WPAFB, OH	41	283.893	20.770	349.510	654.173	311.033	30.000	
Aerospace Medical Research Center	WPAFB, OH	28	183.056	103.523	77.847	364.426	27.795	30.388	
Air Force Development Center	Eglin AFB, FL	455,204	89.852	654.157	9,453.400	10,197.409	432.212	500.884	
Armament Laboratory	Eglin AFB, FL	500	178.500	160.200	25.000	363.700	61.500	54.147	
Arnold Engineering Development Center	Arnold AFB, TN	39,181	1,035.000	216.703	1,274.770	2,526.473	1,027.138	158.282	
Astronautics Laboratory	Edwards AFB, CA	683,450	507.018	166.980	7.150	681.148	179.343	41.752	
Avionics Laboratory	WPAFB, OH	198	152.026	12.536	405.334	569.896	65.904	32.000	
Electronic Technology Laboratory	WPAFB, OH	2	85.987	2.179	45.550	133.716	21.968	10.000	
Engineering and Services Laboratory	Tyndall AFB, FL	0	49.787	1.860	57.186	108.833	4.647	10.780	
Flight Dynamics Laboratory	WPAFB, OH	75	368.868	204.174	94.319	667.361	47.152	38.000	
Flight Test Center	Edwards AFB, CA	297,438	234.851	293.008	8,238.689	8,766.548	510.232	232.370	
Frank J. Seiler Research Laboratory	USAF Academy, CO	0	16.956	1.849	0.000	18.805	1.923	4.814	
Geophysics Laboratory	Bedford, MA	336	395.732	14.281	25.883	435.896	12.350	53.995	
Human Resources Laboratory	Brooks AFB, TX	5	99.348	77.862	51.057	228.267	15.257	126.528	
Materials Laboratory	WPAFB, OH	15	217.785	0.549	159.438	377.772	277.216	34.000	
Rome Air Development Center	Griffiss AFB, NY	1,552	570.374	46.247	418.071	1,034.692	93.803	152.241	
School of Aerospace Medicine	Brooks AFB, TX	1,309	224.672	86.078	422.839	733.589	54.174	29.102	
Weapons Laboratory (AFSC)	Kirkland AFB, NM	90	603.560	235.002	159.354	997.916	114.247	88.000	
4950th Test Wing	WPAFB, OH	400	22.012	129.973	741.409	893.394	27.070	210.000	
6585 Test Group	Holloman AFB, NM	7,052	407.068	39.081	93.979	540.128	228.352	151.966	
		TOTALS:	1,486,876	2,467,012	22,100,785	30,294,142	3,513,316	1,989,249	

TABLE 7. DEFENSE NUCLEAR AGENCY RDT&E ACTIVITIES, PROGRAM AND PERSONNEL DATA, FY 1990										
INSTALLATION	FUNDING DATA (MILLIONS \$)				PERSONNEL DATA					
	TOTAL	IN-HOUSE	TOTALS	IN-HOUSE	TOTAL	PHD	PHD	PHD	PROF	PROF
			RDT&E	RDT&E	MIL	CIV	MIL	CIV	MIL	CIV
Armed Forces Radiobiology Research Institute	20.207	16.360	16.307	16.307	86	199	19	54	51	114
TOTALS:	20.207	16.360	16.307	16.307	86	199	19	54	51	114

TABLE 8. DEFENSE NUCLEAR AGENCY RDT&E ACTIVITIES, FACILITY DATA, FY 1990									
INSTALLATION	LOCATION	SPACE AND PROPERTY						COST (MILLIONS \$)	
		ACRES	SPACE (THOUSANDS OF SQUARE FEET)				REAL PROP.	EQUIP	
			LAB	ADMIN	OTHER	TOTAL			
Armed Forces Radiobiology Research Institute	Bethesda, MD	10	61.750	31.057	24.901		117.708	0.000	19.600
TOTALS:		10	61.750	31.057	24.901		117.708	0.000	19.600

SUMMARY
DEPARTMENT OF DEFENSE IN-HOUSE R&D LABORATORIES
(EXCLUDES PRIMARY T&E ACTIVITIES AND SERVICE RESEARCH OFFICES)

PROGRAM DATA FOR FY 1990 (MILLIONS \$)	
TOTAL ANNUAL PROGRAM	8,260.923
TOTAL IN-HOUSE PROGRAM	7,819.927
TOTAL R&D PROGRAM	5,763.548
TOTAL IN-HOUSE R&D	2,357.723
TOTAL ANNUAL OPERATING COST	783.465

PERSONNEL DATA (END OF FY 1990)			
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROFESSIONAL
MILITARY	6,566	549	2,962
CIVILIAN	43,380	3,603	24,764
TOTAL	49,946	4,152	27,726

PHYSICAL FACILITIES (END OF FY 1990)	
ACRES	1,849,232
SPACE (THOUSANDS OF SQUARE FEET)	
LABORATORY	22,951.861
ADMINISTRATIVE	6,116.206
OTHER	12,616.269
TOTAL	41,684.336
COST (MILLIONS \$)	
REAL PROPERTY	3,351.261
EQUIPMENT	3,306.649
TOTAL	6,657.910

TABLE 1A. ARMY R&D LABORATORIES, PROGRAM AND PERSONNEL DATA, FY 1990

INSTALLATION	FUNDING DATA (MILLIONS \$)				PERSONNEL DATA					
	TOTAL	TOTALS IN-HOUSE	TOTALS R&D	IN-HOUSE R&D	TOTAL MIL	TOTAL CIV	PHD MIL	PHD CIV	PROF MIL	PROF CIV
Aeromedical Research Laboratory	12.410	9.503	9.087	6.180	67	67	15	14	42	21
Armament Research, Develop. & Engr. Center	455.800	455.800	240.300	132.000	79	3,916	0	87	66	2,061
Atmospheric Sciences Laboratory	37.387	18.703	37.336	18.652	3	370	0	31	3	174
Aviation Systems Command	82.660	50.243	71.221	43.740	18	530	1	34	16	303
Avionics Research & Development Activity	23.189	13.576	16.615	10.634	10	203	0	4	3	153
Ballistic Research Laboratory	39.634	26.607	26.672	18.831	16	720	0	122	7	444
Belvoir Research, Develop. & Engr. Center	125.848	43.690	108.091	31.192	46	890	0	27	17	496
Biomedical Research & Development Lab	11.269	9.986	9.960	8.677	26	93	4	15	23	45
Center for Electronic Warfare/RSTA	213.081	19.236	49.855	11.304	37	274	0	8	3	190
Center for Night Vision & Electro-Optics	134.857	40.453	101.369	31.624	28	471	0	44	4	330
Center for Signals Warfare	83.771	16.365	62.375	14.664	35	194	0	2	6	119
Chemical Research, Develop. & Engr. Center	275.128	102.080	199.588	74.372	95	1,251	8	80	40	638
Cold Regions Research & Engineering Lab	27.753	23.550	16.921	14.890	8	308	0	39	7	128
Construction Engineering Research Lab	56.961	33.408	41.258	25.217	3	332	0	40	5	214
Electronics Technology and Devices Lab	88.567	21.662	81.794	19.403	1	301	0	42	1	227
Engineer Topographic Laboratories	91.715	22.061	76.577	14.574	12	383	1	19	6	254
Engineer Waterways Experimentation Station	139.655	83.248	61.367	36.575	21	517	3	137	13	722
Harry Diamond Laboratories	103.950	57.972	83.480	44.307	3	673	0	42	1	402
Human Engineering Laboratory	24.011	15.030	23.263	14.291	31	221	3	19	14	130
Institute of Dental Research	7.410	5.679	5.063	3.332	58	18	16	3	39	7
Institute of Surgical Research	11.988	11.988	5.575	5.575	153	78	17	4	56	23
Letterman Army Institute of Research	20.696	16.242	14.097	9.643	113	107	41	20	96	62
Materials Technology Laboratory	37.049	23.919	33.851	22.321	7	529	1	67	5	236
Medical Research Inst. of Chemical Defense	30.619	22.238	26.271	17.890	81	208	15	34	43	104
Medical Research Inst. of Infectious Diseases	61.531	38.682	49.719	26.870	285	282	52	42	107	114
Missile Research, Develop. & Engr. Center	289.463	79.898	219.538	60.558	81	1,707	0	58	36	1,215
Natick Research, Develop. & Engr. Center	115.151	73.056	75.339	40.225	820	901	2	56	36	405
Research Inst. of Behavioral & Social Sciences	69.524	26.348	66.515	24.137	16	313	1	146	16	193
Research Inst. of Environmental Medicine	10.856	10.046	8.016	7.206	76	92	17	29	30	51
Tank Automotive RD&E Center	95.909	37.854	64.460	19.301	31	869	1	22	19	492
Walter Reed Army Institute of Research	108.474	78.057	80.371	49.954	383	413	98	69	357	260
TOTALS:	2,886.316	1,487.170	1,965.944	858.139	2,643	17,231	296	1,356	1,117	10,213

TABLE 2A. ARMY R&D LABORATORIES, FACILITY DATA, FY 1990

INSTALLATION	LOCATION	ACRES	SPACE AND PROPERTY					COST (MILLIONS \$)	
			SPACE (THOUSANDS OF SQUARE FEET)				TOTAL	REAL PROP.	EQUIP.
			LAB	ADMIN	OTHER				
Aeromedical Research Laboratory	Ft. Rucker, AL	53	99,286	17,520	39,652	156,458	8,256	35,361	
Armament Research, Develop. & Engr. Center	Picatinny Arsenal, NJ	6,487	267,806	1,013,046	2,747,397	4,028,249	139,355	326,700	
Atmospheric Sciences Laboratory	White Sands Msl Rng, NM	15	40,531	81,312	18,549	140,392	2,608	35,601	
Aviation Systems Command	St Louis, MO	127	88,848	58,673	16,370	163,891	2,350	17,106	
Avionics Research & Development Activity	Ft. Monmouth, NJ	2	54,000	10,000	13,350	77,350	0,000	14,426	
Ballistic Research Laboratory	Aberdeen PG, MD	2,005	518,189	137,008	219,377	874,574	28,600	138,400	
Belvoir Research, Develop. & Engr. Center	Ft. Belvoir, VA	1,052	433,533	270,281	84,902	788,716	20,238	37,451	
Biomedical Research & Development Lab	Ft. Detrick, MD	5	74,929	29,090	9,462	113,481	4,703	8,606	
Center for Electronic Warfare/RSTA	Ft. Monmouth, NJ	225	70,744	90,037	0,000	160,781	0,000	0,000	
Center for Night Vision & Electro-Optics	Ft. Belvoir, VA	0	30,000	44,473	37,000	111,473	12,244	60,238	
Center for Signals Warfare	Warrenton, VA	0	11,535	54,579	0,000	66,114	2,937	8,272	
Chemical Research, Develop. & Engr. Center	Aberdeen PG, MD	3,471	804,483	393,785	394,781	1,593,049	54,098	97,386	
Cold Regions Research & Engineering Lab	Hanover, NH	31	107,941	68,697	134,442	311,080	21,643	19,106	
Construction Engineering Research Lab	Champaign, IL	31	58,800	113,000	27,710	199,510	8,200	30,301	
Electronics Technology and Devices Lab	Ft. Monmouth, NJ	0	92,040	47,000	2,000	141,040	0,000	6,340	
Engineer Topographic Laboratories	Ft. Belvoir, VA	0	121,772	9,749	36,998	168,519	22,400	15,010	
Engineer Waterways Experimentation Station	Vicksburg, MS	3,073	1,798,808	353,645	176,809	2,329,262	60,141	66,700	
Harry Diamond Laboratories	Adelphi, MD	2,316	503,364	12,053	121,717	637,134	56,111	62,223	
Human Engineering Laboratory	Aberdeen PG, MD	72	111,524	7,056	21,400	139,980	14,000	26,000	
Institute of Dental Research	Washington, DC	0	18,170	5,696	1,200	25,066	0,000	6,113	
Institute of Surgical Research	Ft. Sam Houston, TX	1	26,424	1,800	22,400	50,624	6,958	6,542	
Letterman Army Institute of Research	Presidio, SF, CA	9	128,960	56,941	138,700	324,601	52,353	15,768	
Materials Technology Laboratory	Watertown, MA	48	424,773	42,011	22,133	488,917	27,132	4,543	
Medical Research Inst. of Chemical Defense	Aberdeen PG, MD	31	40,246	29,145	95,029	164,420	9,548	20,852	
Medical Research Inst. of Infectious Diseases	Ft. Detrick, MD	388	104,136	26,618	205,341	336,595	21,430	33,190	
Missile Research, Develop. & Engr. Center	Redstone Arsenal, AL	15,000	868,000	322,000	210,000	1,400,000	240,000	302,000	
Natick Research, Develop. & Engr. Center	Natick, MA	174	354,428	114,463	343,336	812,227	29,932	30,636	
Research Inst. of Behavioral & Social Sciences	Alexandria, VA	0	53,355	14,000	6,100	73,455	0,807	3,829	
Research Inst. of Environmental Medicine	Natick, MA	0	38,454	5,960	33,750	78,164	4,084	11,647	
Tank Automotive RD&E Center	Warren, MI	11	246,562	23,756	125,214	395,532	278,159	163,516	
Walter Reed Army Institute of Research	Washington, DC	37	311,100	58,400	73,200	442,800	12,293	37,961	
TOTALS:		34,664	7,902,741	3,511,794	5,378,972	16,793,514	1,140,580	1,641,824	

TABLE 3A. NAVY R&D LABORATORIES, PROGRAM AND PERSONNEL DATA, FY 1990

TABLE 2A: NAVY R&D EMPLOYMENT, PERSONNEL, AND FUNDING DATA											
INSTALLATION	FUNDING DATA (MILLIONS \$)				PERSONNEL DATA						
	TOTAL	TOTALS IN-HOUSE	TOTALS R&D	IN-HOUSE R&D	TOTAL MIL	TOTAL CIV	PHD MIL	PHD CIV	PROF MIL	PROF CIV	
Aerospace Medical Research Laboratory	5,341	5,341	5,341	5,341	38	56	10	14	18	32	
Air Propulsion Center	64,159	47,391	52,688	33,609	7	740	0	1	7	227	
Biodynamics Laboratory	3,416	3,288	3,226	3,226	40	41	3	4	10	14	
Civil Engineering Laboratory	56,508	29,554	25,402	19,164	16	400	0	24	6	236	
Clothing & Textile Research Facility	3,755	3,606	1,335	1,048	1	62	0	1	0	44	
David Taylor Research Center	404,383	196,085	273,577	133,368	62	2,753	2	122	41	1,536	
Dental Research Institute	2,177	1,329	1,329	1,329	22	15	6	3	9	6	
Health Research Center	5,709	4,405	5,709	4,405	25	61	4	15	13	36	
Medical Research Institute	26,111	18,900	25,970	18,759	251	205	49	34	93	119	
Medical Research Unit No. 2	4,008	4,008	3,717	3,717	16	101	2	2	8	41	
Medical Research Unit No. 3	7,511	5,934	5,890	5,890	35	213	7	22	13	80	
Naval Research Laboratory	650,706	286,585	388,653	194,765	116	3,479	4	768	30	2,393	
Ocean Systems Center	582,895	365,163	368,794	163,859	254	3,078	0	196	208	1,626	
Oceanographic & Atmospheric Research Lab	67,560	55,283	61,607	35,256	24	487	1	95	15	371	
Personnel Research & Development Center	29,047	17,791	18,381	11,195	25	277	0	71	15	221	
Submarine Medical Research Laboratory	4,513	3,474	4,513	3,474	31	43	6	10	11	26	
Underwater Systems Center	662,331	324,066	312,860	158,823	88	3,569	1	103	83	2,174	
Weapons Center	802,856	408,281	424,936	247,565	491	5,275	0	167	23	2,112	
TOTALS:	3,382,986	1,780,484	1,983,928	1,044,793	1,542	20,855	95	1,652	603	11,294	

TABLE 4A. NAVY R&D LABORATORIES, FACILITY DATA, FY 1990

TABLE 4A. NAVY R&D LABORATORIES, FACILITY DATA, FY 1990									
INSTALLATION	LOCATION	SPACE AND PROPERTY							
		ACRES	SPACE (THOUSANDS OF SQUARE FEET)			COST (MILLIONS \$)			
			LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.	
Aerospace Medical Research Laboratory	Pensacola, FL	1	94.040	6.289	19.672	120.001	11.094	10.140	
Air Propulsion Center	Trenton, NJ	68	488.390	27.962	92.816	609.168	52.800	13.400	
Biodynamics Laboratory	New Orleans, LA	1	25.845	23.149	1.276	50.270	0.000	2.271	
Civil Engineering Laboratory	Port Hueneme, CA	32	105.322	67.893	47.785	221.000	6.300	9.200	
Clothing & Textile Research Facility	Natick, MA	0	12.660	16.000	5.630	34.290	2.000	2.000	
David Taylor Research Center	Bethesda, MD	419	1,748.000	120.000	287.000	2,155.000	86.275	124.800	
Dental Research Institute	Great Lakes, IL	1	21.264	6.001	9.318	36.583	0.000	1.746	
Health Research Center	San Diego, CA	1	19.052	7.159	0.000	26.211	0.000	2.448	
Medical Research Institute	Bethesda, MD	7	115.684	36.664	45.259	197.607	7.063	14.784	
Medical Research Unit No. 2	Manila, Philippines	1	16.892	10.990	4.148	32.030	0.500	2.900	
Medical Research Unit No. 3	Cairo, Egypt	3	82.822	8.862	55.602	147.286	26.750	2.372	
Naval Research Laboratory	Washington, DC	0	2,799.564	196.463	438.769	3,434.796	165.600	151.700	
Ocean Systems Center	San Diego, CA	2,319	1,393.218	204.025	205.657	1,802.900	73.400	190.200	
Oceanographic & Atmospheric Research Lab	Stennis Space Center, MS	0	127.963	28.268	65.096	221.327	14.456	59.970	
Personnel Research & Development Center	San Diego, CA	3	73.320	18.417	0.000	91.737	1.900	12.899	
Submarine Medical Research Laboratory	Groton, CT	1	40.514	14.099	0.000	54.613	0.000	2.380	
Underwater Systems Center	Newport, RI	965	1,416.416	331.660	872.527	2,620.603	146.217	139.107	
Weapons Center	China Lake, CA	1,123,135	2,468.842	315.364	2,763.296	5,547.502	328.014	167.161	
TOTALS:		1,126,957	11,049,808	1,439,265	4,913,851	17,402,924	922,369	909,478	

TABLE 5A. AIR FORCE R&D LABORATORIES, PROGRAM AND PERSONNEL DATA, FY 1990													
INSTALLATION	FUNDING DATA (MILLIONS \$)						PERSONNEL DATA						
	TOTAL	TOTALS IN-HOUSE	TOTALS R&D	IN-HOUSE R&D	TOTAL MIL	TOTAL CIV	PHD MIL	PHD CIV	PROF MIL	PROF CIV			
Aero Propulsion and Power Laboratory	173.254	25.511	171.274	23.531	45	318	4	30	40	229			
Acrospace Medical Research Laboratory	41.412	8.662	36.516	8.659	110	164	15	31	42	98			
Armament Laboratory	130.793	35.396	130.677	35.280	107	394	3	15	90	263			
Astronautics Laboratory	132.000	40.127	132.000	40.127	137	294	4	24	65	168			
Avionics Laboratory	197.019	27.897	192.694	23.572	88	400	0	17	77	321			
Electronic Technology Laboratory	44.256	7.759	43.419	6.922	19	124	2	13	17	93			
Engineering and Services Laboratory	40.502	8.630	15.964	3.397	39	44	6	8	40	36			
Flight Dynamics Laboratory	169.653	47.986	161.575	39.908	113	543	4	33	87	390			
Frank J. Seiler Research Laboratory	3.055	3.055	1.564	1.564	23	9	12	2	14	2			
Geophysics Laboratory	111.890	42.156	107.436	37.982	103	452	3	96	40	241			
Human Resources Laboratory	50.900	13.238	49.409	13.212	162	208	4	47	80	119			
Materials Laboratory	185.648	26.119	183.707	24.178	380	247	4	57	39	199			
Rome Air Development Center	364.995	62.563	297.940	46.181	177	1,069	8	63	117	626			
School of Aerospace Medicine	52.306	43.601	24.399	15.694	313	270	42	44	86	109			
Weapons Laboratory (AFSC)	273.731	143.213	248.795	118.277	479	559	28	61	367	249			
TOTALS:	1,971.414	535.913	1,797.369	438.484	2,295	5,095	139	541	1,191	3,143			

TABLE 6A. AIR FORCE R&D LABORATORIES, FACILITY DATA, FY 1990									
INSTALLATION	LOCATION	ACRES	SPACE AND PROPERTY				COST (MILLIONS \$)		
			SPACE (THOUSANDS OF SQUARE FEET)						
			LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP	
Aero Propulsion and Power Laboratory	WPAFB, OH	41	283.893	20.770	349.510	654.173	311.033	30.000	
Aerospace Medical Research Center	WPAFB, OH	28	183.056	103.523	77.847	364.426	27.795	30.388	
Armament Laboratory	Eglin AFB, FL	500	178.500	160.200	25.000	363.700	61.500	54.147	
Astronautics Laboratory	Edwards AFB, CA	683,450	507.018	166.980	7.150	681.148	179.343	41.752	
Avionics Laboratory	WPAFB, OH	198	152.026	12.536	405.334	569.896	65.904	32.000	
Electronic Technology Laboratory	WPAFB, OH	2	85.987	2.179	45.550	135.716	21.968	10.000	
Engineering and Services Laboratory	Tyndall AFB, FL	0	49.787	1.860	57.186	108.833	4.647	10.780	
Flight Dynamics Laboratory	WPAFB, OH	75	368.868	204.174	94.319	667.361	47.152	38.000	
Frank J. Seiler Research Laboratory	USAF Academy, CO	0	16.956	1.849	0.000	18.805	1.923	4.814	
Geophysics Laboratory	Bedford, MA	336	395.732	14.281	25.883	435.896	12.350	53.995	
Human Resources Laboratory	Brooks AFB, TX	5	99.348	77.862	51.057	228.267	15.257	126.528	
Materials Laboratory	WPAFB, OH	15	217.785	0.549	159.438	377.772	277.216	34.000	
Rome Air Development Center	Griffiss AFB, NY	1,552	570.374	46.247	418.071	1,034.692	93.803	152.241	
School of Aerospace Medicine	Brooks AFB, TX	1,309	224.672	86.078	422.839	733.589	54.174	29.102	
Weapons Laboratory (AFSC)	Kirkland AFB, NM	90	603.560	235.002	159.354	997.916	114.247	88.000	
TOTALS:		687,601	3,937.562	1,134.090	2,298.538	7,370.190	1,288.312	735.747	

TABLE 7A. DEFENSE NUCLEAR AGENCY R&D LABORATORIES, PROGRAM AND PERSONNEL DATA, FY 1990										
INSTALLATION	FUNDING DATA (MILLIONS \$)				PERSONNEL DATA					
	TOTAL	TOTALS IN-HOUSE	TOTALS R&D	IN-HOUSE R&D	TOTAL MIL	TOTAL CIV	PHD MIL	PHD CIV	PROF MIL	PROF CIV
	20.207	16.360	16.307	16.307	86	199	19	54	51	114
Armed Forces Radiobiology Research Institute										
TOTALS:	20.207	16.360	16.307	16.307	86	199	19	54	51	114

TABLE 8A. DEFENSE NUCLEAR AGENCY R&D LABORATORIES, FACILITY DATA, FY 1990									
INSTALLATION	LOCATION	SPACE AND PROPERTY					COST (MILLIONS \$)		
		ACRES	SPACE (THOUSANDS OF SQUARE FEET)			TOTAL	REAL PROP.	EQUIP.	
			LAB	ADMIN	OTHER				
Armed Forces Radiobiology Research Institute	Bethesda, MD	10	61.750	31.057	24.901	117.708	0.000	19.600	
TOTALS:		10	61.750	31.057	24.901	117.708	0.000	19.600	

SUMMARY
MILITARY SERVICES' RESEARCH OFFICES
(ARMY, NAVY, AND AIR FORCE)

PROGRAM DATA FOR FY 1990 (MILLIONS \$)	
TOTAL ANNUAL PROGRAM	2,220.365
TOTAL IN-HOUSE PROGRAM	45.760
TOTAL R&D PROGRAM	2,220.214
TOTAL IN-HOUSE R&D	45.611
TOTAL ANNUAL OPERATING COST	29.970

PERSONNEL DATA (END OF FY 1990)			
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROFESSIONAL
MILITARY	131	45	122
CIVILIAN	826	200	349
TOTAL	957	245	471

PHYSICAL FACILITIES (END OF FY 1990)	
ACRES	2
SPACE (THOUSANDS OF SQUARE FEET)	
LABORATORY	0.000
ADMINISTRATIVE	155.828
OTHER	15.058
TOTAL	170.886
COST (MILLIONS \$)	
REAL PROPERTY	0.000
EQUIPMENT	10.152
TOTAL	10.152

Note: Some funds included here may also be included in the Summaries on pages VI and XVI.

TABLE 9. MILITARY SERVICES' RESEARCH OFFICES, PROGRAM AND PERSONNEL DATA, FY 1990													
INSTALLATION	FUNDING DATA (MILLIONS \$)				PERSONNEL DATA								
	TOTAL	TOTALS		IN-HOUSE RDT&E	TOTAL MIL	TOTAL CIV		PHD MIL	PHD CIV	PROF MIL	PROF CIV		
		IN-HOUSE	RDT&E										
Army Research Office	89.421	0.149	89.272	0.000	2	110	0	40	2	41			
Office of the Chief of Naval Research	1,873.354	45.611	1,873.354	45.611	42	589	3	124	36	181			
Air Force Office of Scientific Research	257.590	0.000	257.588	0.000	87	127	42	36	84	127			
TOTALS:	2,220.365	45.760	2,220.214	45.611	131	826	45	200	122	349			

TABLE 10. MILITARY SERVICES' RESEARCH OFFICES, FACILITY DATA, FY 1990									
INSTALLATION	LOCATION	SPACE AND PROPERTY					COST (MILLIONS \$)		
		SPACE (THOUSANDS OF SQUARE FEET)		ACRES	TOTAL		REAL PROP.	EQUIP	
		LAB	ADMIN		OTHER	TOTAL			
Army Research Office	Rsch Triangle Park, NC	2	0.000	29.420	0.000	29.420	0.000	1.172	
Office of the Chief of Naval Research	Arlington, VA	0	0.000	90.720	9.930	100.650	0.000	8.713	
Air Force Office of Scientific Research	Washington, DC	0	0.000	35.688	5.128	40.816	0.000	0.267	
TOTALS:		2	0.000	155.828	15.058	170.886	0.000	10.152	

SERVICE RESEARCH OFFICES

DIR: DR. GERALD J. IAFRATE

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	89.272	121.587
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	0.149	0.131
TOTAL ANNUAL LAB	89.421	121.718
TOTAL INHOUSE	0.149	0.131
TOTAL INHOUSE RDT&E	0.000	0.000
ANNUAL OPERATING COST	6.607	6.855

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	2	0	2	0
CIVILIAN	110	40	41	69
TOTAL	112	40	43	69

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
2	0.000	29.420	0.000	29.420	0.000	1.172

MISSION

University research initiative with eleven (11) centers in ten (10) major thrust areas. Develop the AMC research programs for mathematics and the physical, engineering, atmospheric, terrestrial and biological sciences IAW Army requirements. Assess, evaluate and prioritize the AMC 6.1 program. Evaluate and assess the technology base programs to include the impact of IR&D.

CURRENT IMPORTANT PROGRAMS

Research in material science and engineering.
Chemical and biological defense.
Rotary wing aircraft research.
Research in target acquisition.

FUNCTIONS/EQUIPMENT/FACILITIES

Evaluation of research proposal and research program performance.

OFFICE OF THE CHIEF OF NAVAL RESEARCH

ARLINGTON, VA

CDR: RADM W. C. MILLER

TECH DIRECTOR: DR. F. E. SAALFELD (ONR)
DR. P. A. SELWYN (ONT)

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	1,873.354	2,095.959
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	0.000	0.000
TOTAL ANNUAL LAB	1,873.354	2,095.959
TOTAL INHOUSE	45.611	46.423
TOTAL INHOUSE RDT&E	45.611	46.423
ANNUAL OPERATING COST	23.363	23.605

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	42	3	36	6
CIVILIAN	589	124	181	408
TOTAL	631	127	217	414

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	0.000	90.720	9.930	100.650	0.000	8.713

MISSION

Responsible for management of Navy research program and exploratory development program through Navy R&D laboratories/centers, financial management of RDT&E appropriation for ASN (RD&A), contract management of federally funded university research.

CURRENT IMPORTANT PROGRAMS

Basic research and exploratory development programs.
Navy-wide RDT&E appropriation administration.
Focal point for world-wide research information.
Contract management program at educational institutions.

FUNCTIONS/EQUIPMENT/FACILITIES

Administration of research programs in physical sciences, mathematical informational sciences, biological sciences, psychological sciences, arctic and earth sciences, mathematical sciences, engineering sciences, ocean sciences and technology administration of entire exploratory development program including management through Navy laboratories/centers. Programs range from analytical investigations to testing and evaluation of system prototypes. Activities include NRL, and NOARL, maintains research reserve program. Coordinates Naval research and promotes cooperative research efforts within Navy, other DoD, NSF, NASA, Department of Energy and other government research groups and with industry and non-profit groups and administration of Naval Research Advisory Committee.

DIR: DR. HELMUT HELLWIG

DEPUTY DIR: COL. ARTHUR PAVEL

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	257.588	290.000
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.002	0.000
TOTAL OTHER	0.000	0.000
TOTAL ANNUAL LAB	257.590	290.000
TOTAL INHOUSE	0.000	0.000
TOTAL INHOUSE RDT&E	0.000	0.000
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	87	42	84	3
CIVILIAN	127	36	127	0
TOTAL	214	78	211	3

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	0.000	35.688	5.128	40.816	0.000	0.267

MISSION

Manages the Air Force's basic research program. Prevent technological surprise and maintain technological superiority in areas relevant to Air Force needs. Maintain a strong research infrastructure composed of laboratories, industry, and universities complementing the national research effort.

CURRENT IMPORTANT PROGRAMS

Active vortex control to enhance aerodynamic performance.
 Development of low-cost synthesis for high-strength optical polymers.
 Organic-on-inorganic materials engineered for photonic devices/systems.
 Design of optical scanners by numerical computing.
 Neural network for adaptive robotic control and vision.

FUNCTIONS/EQUIPMENT/FACILITIES

Manages the Air Force's research program and sponsors extramural research.

DEPARTMENT OF THE ARMY

AEROMEDICAL RESEARCH LABORATORY**FT. RUCKER, AL****CDR: COL DAVID H. KARNEY****DEP COMMANDER: COL J.D. LAMOTHE**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	9.087	9.658
TOTAL PROCUREMENT	0.000	0.015
TOTAL O&M	0.005	0.005
TOTAL OTHER	3.318	3.463
TOTAL ANNUAL LAB	12.410	13.141
TOTAL INHOUSE	9.503	10.537
TOTAL INHOUSE RDT&E	6.180	7.054
ANNUAL OPERATING COST	2.688	2.609

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	67	15	42	25
CIVILIAN	67	14	21	46
TOTAL	134	29	63	71

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
53	99.286	17.520	39.652	156.458	8.256	35.361

MISSION

Conducts medical research into military aviation, vehicles, and weapons systems environment and their effects on crewmembers' health and performance. Conducts research on medical defense against chemical agents, impact of continuous operations on crew performance, and health hazards analysis of emerging military material systems.

CURRENT IMPORTANT PROGRAMS

Aviator performance effects of chemical agent/antidote therapies.

Biomechanical stress.

Flight simulator sickness problem definition.

Blast overpressure tolerance.

Contact lenses in military environments.

FUNCTIONS/EQUIPMENT/FACILITIES

Single and multi-axis vibration systems; helmet drop test tower and impact facility; variable center of gravity helmet device; cardiopulmonary lab; biochemistry lab; UH-60 AeroMed research flight simulator; helicopter in-flight monitoring system; modified aircraft for in flight medical research; data acquisition and biotelemetry system; in-house/mobile on-board oxygen generating system; vivarium; high intensity impulse noise generator (shock tube); mobile acoustics lab; anechoic and reverberation chambers; bio-optical testing lab; optical fabrication lab; electro-optical testing lab; mobile visual studies lab; visual neurophysiology lab; scientific and medical research information center (library); analog and digital computer system; MedEvac equipment testing facility.

AIRWORTHINESS QUALIFICATION TEST DIRECTORATE EDWARDS AFB, CA**DIR: LTC LYNN HANKS****CHIEF ENGINEER: JOHN BLAHA**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	8.064	0.000
TOTAL PROCUREMENT	0.134	0.000
TOTAL O&M	0.191	0.000
TOTAL OTHER	0.041	0.000
TOTAL ANNUAL LAB	8.430	0.000
TOTAL INHOUSE	7.438	0.000
TOTAL INHOUSE RDT&E	7.173	0.000
ANNUAL OPERATING COST	2.572	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	52	0	27	25
CIVILIAN	98	0	29	69
TOTAL	150	0	56	94

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
33,518	9.200	16.000	124.000	149.200	4.725	45.263

MISSION

Conduct airworthiness testing of all Army air vehicles. Support readiness through flight testing in response to field identified airworthiness problems. Sustain and continue development of highly instrumented fleet of Army aircraft. Conduct prenaval test pilot orientation program.

CURRENT IMPORTANT PROGRAMS

Engine and airframe integration of AH-1 with the MK-66 2.75 inch rocket.
LHX source selection data source for handling qualities performance & HF.
Airworthiness and flying qualities of UH-60A with external stores system.
Preliminary airworthiness evaluations of MH-60K and MH-47E helicopters.
Engine and airframe integration of the 701-C engine and AH-64A Apache.

FUNCTIONS/EQUIPMENT/FACILITIES

Instrumentation lab capable of design, fabrication, installation and operation of state-of-the-art highly calibrated packages to measure and record all aircraft systems and subsystems as well as atmospheric conditions. Aircraft maintenance and all related shops capable of supporting both foreign produced and one-of-a-kind experimental aircraft. Data reduction and analysis capability built around a series of VAX microcomputers to support engineering efforts. Maintain a highly modified CH-47 with icing spray system and JU-21 with an atmospheric airborne data analysis capability for the conduct of both natural and artificial icing flight testing of entire aircraft. Facilities at low, medium and high altitudes to support flight tests. Maintain full photographic video and graphic arts capability to support report preparation and publication.

CDR: BG WILLIAM R. HOLMES TECH DIRECTOR: DR. THOMAS E. DAVIDSON

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	240.300	0.000
TOTAL PROCUREMENT	174.900	0.000
TOTAL O&M	40.600	0.000
TOTAL OTHER	0.000	0.000
TOTAL ANNUAL LAB	455.800	0.000
TOTAL INHOUSE	254.800	0.000
TOTAL INHOUSE RDT&E	132.000	0.000
ANNUAL OPERATING COST	62.200	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	79	0	66	13
CIVILIAN	3,916	87	2,061	1,855
TOTAL	3,995	87	2,127	1,868

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
6,487	267.806	1,013.046	2,747.397	4,028.249	139.355	326.700

MISSION

Maintain strong technical base. Conduct research, development and life cycle engineering for armament, munitions and assigned material development and improvement. Support production, fielding and provide life cycle engineering support of armament systems including attendant fire control, conventional and nuclear munitions and common tool and equipment items for tri-service personnel.

CURRENT IMPORTANT PROGRAMS

Insensitive munitions to decrease sensitivity of propellants and explosives.
 Smart munitions to develop high peak fire-and-forget systems.
 Advanced propulsion techniques, electric guns, liquid and solid propellants, unicharges.
 Advanced tank cannon system to greatly increase tank field effectiveness.
 Advanced field artillery system for deep attack of high payoff targets.

FUNCTIONS/EQUIPMENT/FACILITIES

Twenty-five million electron-volt betatron dynamic gun control facility; electric gun control facility; full scale climatic control test room; high altitude test chamber facility; intelligent sensor based robotics; one million volt resotron X-ray system; powder gymnasticator; scientific and engineering mainframe computer center; video teleconferencing center.

ATMOSPHERIC SCIENCES LABORATORY**WHITE SNDS MSL RNG, NM****CDR: COL GUNNAR C. CARLSON****TECH DIRECTOR: JAMES E. MORRIS**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	37.336	39.263
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.051	0.552
TOTAL OTHER	0.000	0.586
TOTAL ANNUAL LAB	37.387	40.401
TOTAL INHOUSE	18.703	20.559
TOTAL INHOUSE RDT&E	18.652	19.435
ANNUAL OPERATING COST	4.208	6.866

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	3	0	3	0
CIVILIAN	370	31	174	196
TOTAL	373	31	177	196

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADM.IN	OTHER	TOTAL	REAL PROP.	EQUIP.
15	40.531	81.312	18.549	140.392	2.608	35.601

MISSION

Provide the Army in the field with atmospheric systems and tactical decision aids. Provide atmospheric effects for the design of Army weapon systems, tactics, doctrine and training. Provide meteorological support to Army RDT&E activities.

CURRENT IMPORTANT PROGRAMS

Model of Atmospheric Chemical Hazard (MACH).

Mobile imaging spectroscopy laboratory.

Best two field experiment.

Portable weather satellite imagery.

Combined meteorological profile methodology.

FUNCTIONS/EQUIPMENT/FACILITIES

The Atmospheric Sciences Laboratory (ASL) provides essential support in tests of Army weapons and material, helping quantify atmospheric effects and determining corrective modifications. ASL conducts basic research to identify new remote meteorological sensing techniques and to model the behavior of smokes, chemicals and radiations in the atmosphere. ASL conducts exploratory software development to evaluate atmospheric effects on Army systems, tactics and functions and provides tactical decision aids for the battlefield commander. ASL also develops cost effective and state-of-the-art tactical meteorological sensor systems to support the battlefield commander. ASL performs assessments of the atmospheric impact on the propagation and operation of directed energy (laser) weapons.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	71.221	80.615
TOTAL PROCUREMENT	0.768	1.079
TOTAL O&M	1.812	2.397
TOTAL OTHER	8.859	0.211
TOTAL ANNUAL LAB	82.660	84.302
TOTAL INHOUSE	50.243	43.052
TOTAL INHOUSE RDT&F	43.740	43.747
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	18	1	6	2
CIVILIAN	530	34	303	227
TOTAL	548	35	319	229

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
127	88.848	58.673	16.370	163.891	2.350	17.106

MISSION

Conduct advanced technology R&D for future Army aviation systems. Broad range of technologies include aerodynamics, flight controls, structures, propulsion, man-machine integration, survivability and weaponization. Provide technology support to fielded aircraft fleet and program managers.

CURRENT IMPORTANT PROGRAMS

Day/night adverse weather pilotage system.
Integrated high performance turbine engine technology.
Advanced platform technology.
Air-to-air mission equipment package/weapons integration demonstration.
Aircraft/aircrew integration.

FUNCTIONS/EQUIPMENT/FACILITIES

Three directorates at Moffett Field, CA; Cleveland, OH; and Hampton, VA. Co-located with NASA. Participating in aeronautical research and disciplines. Jointly using wind tunnels, simulators and laboratory test facilities, including shops, flight line and hangar, engine and transmission test facilities, and computational equipment. Fourth directorate at Ft. Eustis, VA performing advanced application work including aircraft weaponization and mission support equipment. Major equipment and facilities are filament winding machines, tensile testers, vibration testing facility, small ballistic range, calibration lab, environment chamber, telemeter ground station, non-destructive test facility and flight safety lab. New expanded facilities include the fatigue and fracture facility, icing research tunnel and the linear transonic cascade.

AVIATION TECHNICAL TEST CENTER**FT. RUCKER, AL****CDR: COL TROY E. BURROW****TECH DIRECTOR: JIM MCCRORY**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	12.283	14.533
TOTAL PROCUREMENT	2.710	0.323
TOTAL O&M	4.708	8.139
TOTAL OTHER	7.953	4.389
TOTAL ANNUAL LAB	27.654	27.384
TOTAL INHOUSE	27.654	27.384
TOTAL INHOUSE RDT&E	12.283	14.533
ANNUAL OPERATING COST	6.796	7.702

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	83	0	18	65
CIVILIAN	89	0	34	55
TOTAL	172	0	52	120

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
1,196	1,900.000	52.320	121.263	2,073.583	2.124	0.798

MISSION

Plan, conduct, and report on tests of aviation systems and aviation related support equipment for Army, non-Army government agencies and private industry.

CURRENT IMPORTANT PROGRAMS

Lead the fleet testing.
 Air-to-air Stinger.
 Grizzly Hunter.
 AH-64 Apache (long bow).
 Light helicopter family.

FUNCTIONS/EQUIPMENT/FACILITIES

Thirty fixed and rotary wing aircraft are assigned (1 U-21, 1 H-18, 1 AH-64, 3 AH-1S, 3 AH-1F, 1 CH-47, 7 CH-3, 1 MI-8, 1 MI-2, 1 OH-58A, 1 OH-58C, 1 UH-60L, 5 UH-1H, 2 UH-60A) which may be used as test beds for all components, equipment or supplies applicable to that aircraft series. A modular engine test system provides accurate measurements of turbine engine performance for engines up to 5000 Rated Hp and weight up to 2000 lbs. On-site data processing and display capability exists with real time processing, HP3000 ADACS data base, an IBM 4361 computer system and a network of PCs. Technical photographic capability is available to include video and 16mm instrumentation cameras. The instrumentation lab can collect analog and digital measurements using 14 track instrumentation capability, strip-chart and oscillograph recording capability.

DIR: DAVID V. GAGGIN

DEP DIRECTOR: A. CHARLES MAROTTA

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	16.615	0.000
TOTAL PROCUREMENT	3.449	0.000
TOTAL O&M	2.602	0.000
TOTAL OTHER	0.523	0.000
TOTAL ANNUAL LAB	23.189	0.000
TOTAL INHOUSE	13.576	0.000
TOTAL INHOUSE RDT&E	10.634	0.000
ANNUAL OPERATING COST	3.921	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	10	0	3	7
CIVILIAN	203	4	153	50
TOTAL	213	4	156	57

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
2	54.000	10.000	13.350	77.350	0.000	14.426

MISSION

Responsible for that portion of AVSCOM's mission which pertains to avionics from research through first-time production. This encompasses: systems architecture; avionics hardware (i.e. communication, navigation, cockpit instrumentation, airborne command and control); and systems engineering integration.

CURRENT IMPORTANT PROGRAMS

Digital cockpit integration.
Integrated communications, navigation, identification, avionics.
Aviation battle management concept.
Aircraft navigation.
Voice interactive avionics.

FUNCTIONS/EQUIPMENT/FACILITIES

Major equipment includes digital hot bench, automated data collection and reduction equipment, and audio/digital analyzers. Facilities include Tactical Avionics Simulator (TASS), Systems Test bed for Avionics Research (STAR), audio acoustic facility, adjacent heliport, avionics integration research laboratory, navigation van, antenna research facility, and cockpit evaluation facility.

DIR: JOHN T. FRASIER

DEP DIRECTOR: LTC CHARLES K. GAILEY, III

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	26.672	78.878
TOTAL PROCUREMENT	1.536	0.488
TOTAL O&M	2.516	4.598
TOTAL OTHER	8.910	7.045
TOTAL ANNUAL LAB	39.634	91.009
TOTAL INHOUSE	26.607	55.717
TOTAL INHOUSE RDT&E	18.831	48.636
ANNUAL OPERATING COST	16.000	16.500

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	16	0	7	9
CIVILIAN	720	122	444	276
TOTAL	736	122	451	285

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
2,005	518.189	137.008	219.377	874.574	28.600	138.400

MISSION

To serve as lead lab for research in ballistics and vulnerability/vulnerability reduction. To establish and maintain a weapons oriented basic research program in defense-related technologies. To solve military problems related to ballistics and vulnerability.

CURRENT IMPORTANT PROGRAMS

Survivability enhancement for protective armors, insensitive munitions, and vulnerability assessment. Direct fire research in gun propulsion, kinetic energy penetrators, chemical energy warheads. Fire support in smart weapons systems. Analysis/modeling in vulnerability/lethality methodology. High performance computing in support for R&T in basic research.

FUNCTIONS/EQUIPMENT/FACILITIES

US Army's first two super computers. Full-scale ranges for testing of novel armors and anti-armor munitions. Full-scale ranges for flight dynamics tests. Full-scale roll, pitch and yaw simulator. Rotor blade test facility. Shaped-charge test facility. Explosives lab. Shock tube facilities for nuclear blast simulation. Electro-optical test range for target signature studies. Anechoic chamber for testing of radar and other equipment. Full-scale projectile soft recovery system. Behind armor debris data collection and analysis range. High altitude blast chamber. Hot melt facility for experimental fabrication of explosives. Vulnerability/lethality models for description and analysis of military material. CAD/CAM/CAE equipment interfacing with CNC lathes for experimental fabrication penetrators and sabots.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	108.091	107.840
TOTAL PROCUREMENT	0.000	9.562
TOTAL O&M	17.757	13.659
TOTAL OTHER	0.000	0.000
TOTAL ANNUAL LAB	125.848	131.061
TOTAL INHOUSE	43.680	43.800
TOTAL INHOUSE RDT&E	31.192	37.692
ANNUAL OPERATING COST	34.332	29.550

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	46	0	17	29
CIVILIAN	890	27	496	394
TOTAL	936	27	513	423

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
1,052	433.533	270.281	84.902	788.716	20.238	37.451

MISSION

The center's mission is to perform RDT&E to provide material and technical capabilities to the Army in the field for combat support and combat service support in 18 fields of endeavor which are grouped into four program areas: logistics equipment; materials, fuels and lubricants; combat engineering; and countermines systems.

CURRENT IMPORTANT PROGRAMS

Camouflage and deception.
Tactical logistics systems/fuels handling equipment.
Countermines/Counterobstacle equipment.
Tactical electric power systems.
Bridging systems.

FUNCTIONS/EQUIPMENT/FACILITIES

Center facilities include automated camouflage generation facility, sensor test and evaluation facilities, radio frequency anechoic chamber, bridge test hanger, mobile stress analysis van, truck stability tilt table, vehicle test tracks, shock and vibration dynamics simulator, environmental simulator, rail impact test and material R&D test facilities, motion picture/visual pictorial support facility and model fabrication shop. Labs have capability of performing numerous tests and evaluations such as explosive, acoustic, environmental endurance, electrical/electronic, etc., along with device/system design and engineering to support and fulfill the center's mission. Major contracts awarded included Leguan bridge system, Ultra-Light Camouflage Net System (ULCANS), design fabrication of prototype Arctic Forward Area Refueling Equipment (AFARE), high power microwave and countermines program field demonstration.

CDR: COL STEPHEN C. HEMBREE

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	9.960	6.742
TOTAL PROCUREMENT	0.006	0.007
TOTAL O&M	0.052	0.050
TOTAL OTHER	1.251	1.180
TOTAL ANNUAL LAB	11.269	7.979
TOTAL INHOUSE	9.986	7.654
TOTAL INHOUSE RDT&E	8.677	6.417
ANNUAL OPERATING COST	1.037	1.317

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	26	4	23	3
CIVILIAN	93	15	45	48
TOTAL	119	19	68	51

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
5	74.929	29.090	9.462	113.481	4.703	8.606

MISSION

Perform R&D of field medical material primarily for use in the forward areas of the combat zone, in evacuation, and for unconventional warfare. Conduct research to protect soldiers, civilian employees, and the environment from adverse effects of exposure to chemicals used in military operations.

CURRENT IMPORTANT PROGRAMS

Occupational exposure risk assessment of liquid gun propellant.
 Environmental impact of composting to treat explosive process waste.
 Development of a small X-ray unit for use by special operations forces.
 Development of new surgical scrub sink and folding litter for field use.
 Development of bio-monitoring system to rapidly assess aquatic toxicity.

FUNCTIONS/EQUIPMENT/FACILITIES

Industrial capabilities for construction of prototype items and limited scale manufacturing. Laboratories to study insect-borne disease control material and techniques. Equipment to conduct environmental and developmental testing of medical equipment. Aquatic toxicology, chemistry, and microbiological laboratories. Chamber to collect combustion products of military munitions. Tests stands for water and wastewater treatment technologies. Capability to work with wood and fabrics to produce prototypes. Mobile bio-monitoring to assess aquatic contamination on site at Army facilities.

CDR: MG BILLY M. THOMAS

DIRECTOR: MR. R. WHITMAN

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	53.467	0.000
TOTAL PROCUREMENT	18.382	0.000
TOTAL O&M	12.490	0.000
TOTAL OTHER	0.000	0.000
TOTAL ANNUAL LAB	84.339	0.000
TOTAL INHOUSE	20.673	0.000
TOTAL INHOUSE RDT&E	13.043	0.000
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	14	0	4	10
CIVILIAN	324	10	236	88
TOTAL	338	10	240	98

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	58.000	50.000	4.000	112.000	0.000	13.744

MISSION

Center for C3 systems; mission is to perform research development and engineering activities to advance and apply state-of-the-art in C3 systems and capabilities, to provide technical support to project managers and other customers, and to support the troop users in the field.

CURRENT IMPORTANT PROGRAMS

Distributed C3 technology products for tactical field applications.
Fiber optics for Army applications, including fiber optic systems and cables.
VHF hopping multiplexer and high power broadband vehicle whip antenna.
Singars packet applique, digital radio, and HF modem development.
Army secure operations systems for computers and Army key management systems.

FUNCTIONS/EQUIPMENT/FACILITIES

Net radio lab devoted to RDT&E of HF and VHF radios, modem, and ancillary devices.
Acoustics lab equipped with anechoic and reverberant chambers and associated automated audio test and measurement equipment. Electromagnetic (EMI) lab used to ascertain EMI characteristics of tactical military system development. Artificial intelligence (AI) labs to investigate and develop techniques of AI to improve C2. Communications systems design center provides engineering support for developing and fielding communications systems. Fiber optics lab develops, tests, and evaluates new fiber optic components and systems. Command, Control and Communications systems simulation facility performs simulations of Army communications systems, both current and proposed. Rapid configuration lab provides rapid performance checkout for project managers of alternative systems and sub-configurations.

CDR: BG ALFRED MALLETT

DIRECTOR: MR. EUGENE FAMOLARI, JR

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	49.855	26.368
TOTAL PROCUREMENT	156.543	25.487
TOTAL O&M	2.578	1.381
TOTAL OTHER	4.105	0.000
TOTAL ANNUAL LAB	213.081	53.236
TOTAL INHOUSE	19.236	37.332
TOTAL INHOUSE RDT&E	11.304	18.471
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	37	0	3	34
CIVILIAN	274	8	190	84
TOTAL	311	8	193	118

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
225	70.744	90.037	0.000	160.781	0.000	0.000

MISSION

Provide the Army with enhanced capabilities for surveillance, target acquisition, identification, emitter location and identification of combat vehicles and material, self-protection, radiation detection and classification, and weather data.

CURRENT IMPORTANT PROGRAMS

Directional Infrared Countermeasures (DIRCM).
 Apache Escort Jammer.
 Warlock.
 Guardrail.
 Stingray.

FUNCTIONS/EQUIPMENT/FACILITIES

VAX 11/730 for threat deployment simulation and for a specialized R&D facility for launching and tracking meteorological balloons. Electro-optics infrared (EO-IR) threat analysis laboratory. Radar measurement facility used to record non-communications pulse environment. Antenna facility consisting of ASN anechoic chamber, outdoor measurement and associated instrumentation. DGTS is a software based system for development and testing of EW/RSTA systems. A gamma radiation source enhances the radiation exposure capability for radiac dose-rate and dose sensor development facility. Multi-sensor integration computer facility. Multiple analysis of signals of targets for early recognition computer facility.

DIR: RUDOLF G. BUSER

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	101.369	116.897
TOTAL PROCUREMENT	9.269	16.324
TOTAL O&M	4.152	5.364
TOTAL OTHER	20.067	24.694
TOTAL ANNUAL LAB	134.857	155.279
TOTAL INHOUSE	40.453	35.223
TOTAL INHOUSE RDT&E	31.624	29.827
ANNUAL OPERATING COST	10.055	8.100

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	28	0	4	24
CIVILIAN	471	44	330	141
TOTAL	499	44	334	165

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	30.000	44.473	37.000	111.473	12.244	60.238

MISSION

Provide technology and equipment to permit target acquisition at night as effective in day, through smoke and adverse weather while at the same time reducing the task loading of the operator.

CURRENT IMPORTANT PROGRAMS

Second generation high performance IR sensors and focal plane arrays. Aided target recognition. Countermeasures lasers/counter-countermeasures devices and technology. Sensor performance modeling/analysis and field evaluations. Prototype development of night vision and electro-optic demonstrations.

FUNCTIONS/EQUIPMENT/FACILITIES

Major equipment and facilities capabilities include: small arms firing range, AP Hill drop range, algorithm enhancement computer facility, optics test and evaluation facility, infrared material clean room, advanced sensor/ATR processor test facility, digital terrain board, molecular beam epitaxial facility, Davison airfield test facility, detector/dewar test facility, common module electronics test facility.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	62.375	64.496
TOTAL PROCUREMENT	7.184	1.770
TOTAL O&M	14.212	16.291
TOTAL OTHER	0.000	0.000
TOTAL ANNUAL LAB	83.771	82.557
TOTAL INHOUSE	16.365	14.105
TOTAL INHOUSE RDT&E	14.664	12.748
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	35	0	6	29
CIVILIAN	194	2	119	75
TOTAL	229	2	125	104

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	11.535	54.579	0.000	66.114	2.937	8.272

MISSION

Provide an effective signals Intelligence/Electronic Warfare (IEW) material capability to the US Army through technology development and prototype demonstrations, development, production and fielding of equipment and systems for strategic needs, support to the project manager, signal warfare; and others in the development and production of tactical IEW systems.

CURRENT IMPORTANT PROGRAMS

Trojan.
Friar.
Artificial Intelligence (AI) Fusion Research.
Communications Electronic Countermeasures (ECM).
Strategic Systems.

FUNCTIONS/EQUIPMENT/FACILITIES

Signals analysis lab, state-of-the-art electronic equip (some one of a kind), signals processing lab for R&D of non-coop signal processing. Within facility are direction finding and modem test beds for development of various signal processes. Facility is surrounded by a 6-square mile, co-located antenna field with controlled access. Communications Electronics Countermeasures (ECM) lab for communications ECM effectiveness and to define new ECM techniques. Tactical intelligence data fusion test bed devices and demonstrations. Application of technique required to automate the manpower intensive nature of tactical intelligent data fusion process. C2CW has R&D facility in operational overseas installation. This facility has permanently assigned C2CW technical and operational personnel.

CDR: BG J.A. VAN PROOYEN

TECH DIRECTOR: MICHAEL L. PARKER

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	199.588	224.957
TOTAL PROCUREMENT	43.076	65.807
TOTAL O&M	29.314	34.351
TOTAL OTHER	3.150	3.300
TOTAL ANNUAL LAB	275.128	328.415
TOTAL INHOUSE	102.080	104.013
TOTAL INHOUSE RDT&E	74.372	78.713
ANNUAL OPERATING COST	17.325	18.200

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	95	8	40	55
CIVILIAN	1,251	80	638	613
TOTAL	1,346	88	678	668

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
3,471	804.483	393.785	394.781	1,593.049	54.098	97.386

MISSION

Antimaterial systems, chemical retaliatory munitions. Flame/incendiary is a research, development and engineering center providing US forces with capability to operate on a chemical/biological battlefield and deter chemical attack. Provide life cycle engineering for chemical weapons and chemical/biological defense. Act as DOD lead lab for chemical defense/deterrence. Conduct smoke/obscurant technical base. Coordinate ITL programs.

CURRENT IMPORTANT PROGRAMS

Chemical/biological reconnaissance, detection and identification.
Individual/collective protection, basic research in chemistry.
Chemical/biological decontamination and contamination avoidance.
Smoke and novel effects.

FUNCTIONS/EQUIPMENT/FACILITIES

Major equipment is contained in a complex of engineering/laboratory area and includes: process engineering facility; aerosol physics laboratory; smoke munitions filling facility; production and facility design chamber for studies of respiratory protection design drivers; simulant agent challenge test chamber; rubber/elastomer mold facility; specialized chemical agent labs; pyrotechnic mixing, loading, handling facility; subsonic, supersonic, transonic wind tunnel; complete analytical chemistry (trace analysis/tandem mass spectrometry); obscurant test chambers for transmission measurements (UV through microwaves); laser spectroscopy laboratory; robotically-operated toxic agent laboratory; 50-station CAD/E/M network; advanced systems integration laboratory. Lead U.S. lab for international research, development and standardization.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	16.921	16.565
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.783	1.000
TOTAL OTHER	10.049	11.379
TOTAL ANNUAL LAB	27.753	28.944
TOTAL INHOUSE	23.550	24.706
TOTAL INHOUSE RDT&E	14.890	14.577
ANNUAL OPERATING COST	6.562	6.890

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	8	0	7	1
CIVILIAN	308	39	128	180
TOTAL	316	39	135	181

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
31	107.941	68.697	134.442	311.080	21.643	19.106

MISSION

As the Army's comprehensive expert on cold regions problems the Cold Regions Research and Engineering Laboratory (CRREL) investigates the nature of and the effects of cold and winter on military activities where winter and cold represents a severe problem. Manage the Army cold regions technical information analysis center.

CURRENT IMPORTANT PROGRAMS

Fundamental knowledge of behavior of snow, ice and frozen and thawing soil.
 Combined operations; impact of winter on army operations, weapon systems and material.
 Effects of cold on construction, operation/maintenance of military facilities.
 Improve winter navigation, develop environmental remote sensing applications.
 Water resources in winter, environment management of cold regions, sea ice geophysics.

FUNCTIONS/EQUIPMENT/FACILITIES

CRREL's main laboratory contains 24 cold labs that can be operated to -35°F, an electron microscope lab, a soils physics lab, trace chemical analysis labs including a clean room complex, a small laser facility, a materials testing lab, an impact test facility for low temperature testing of materials, a greenhouse, and an equipment test facility for large scale equipment tests to -25°F. An ice engineering facility including a snow-drift modeling wind tunnel and a frost effects research facility are located on site for large scale ice and soil test experiments. The CRREL-Alaska office at Fairbanks provides research logistics support and maintains coordination with Alaska agencies. The military and civilian staff have expertise over a wide range of scientific and engineering disciplines related to cold regions research all supported by a fiber optic computer environment.

COLD REGIONS TEST CENTER**FT. GREELY, AK****CDR: LTC KARL R. WOODRUFF****TECH DIRECTOR: WILLIAM J. HASLEM**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	5.111	5.384
TOTAL PROCUREMENT	0.263	0.295
TOTAL O&M	0.000	0.000
TOTAL OTHER	6.670	2.129
TOTAL ANNUAL LAB	12.044	7.808
TOTAL INHOUSE	12.044	7.808
TOTAL INHOUSE RDT&E	5.111	5.384
ANNUAL OPERATING COST	3.129	2.380

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	88	0	13	75
CIVILIAN	32	0	10	22
TOTAL	120	0	23	97

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
125,475	0.000	35.432	129.204	164.636	17.839	15.187

MISSION

Plan, conduct, and report the results of cold region, mountain and northern environmental phases of technical and other tests. Review plans and monitor technical testing IAW integrated testing cycle policies. Provide advice and guidance to government agencies and private industry.

CURRENT IMPORTANT PROGRAMS

ABFVS A2 600hp performance test.
 Product improvements for the M1A1 tank system.
 Howitzer improvement program arctic testing.
 Shelter Maintenance Transport (SMT).
 Modular Pack Mine System (MOPMS).

FUNCTIONS/EQUIPMENT/FACILITIES

Facility can accommodate a wide variety and large number of tests at any one time. A vehicle test course and extensive cross country terrain ranges are available. Large restricted air space with unrestricted firing to 10,000 ft ordinate. 500,000 acre impact area. Coordination with FAA can affect unrestricted ordinate. Third order survey points. Phone, non-tactical radio at all ranges and test sites. Autodin, facsimile, teletype, photo lab and limited maintenance capability for majority of equipment, including limited engineering support. Army Aviation and USAF aircraft can be arranged. Calibration and meteorological support available. Instrumentation for most items available. Can obtain other instruments. Moving target system. Statistical, main evaluation and human factors capabilities available. Computer support available. Temperatures to -50°F common. Good secondary roads.

COMBAT SYSTEMS TEST ACTIVITY**ABERDEEN PG, MD****CDR: COL ROY E. FOUCH****TECH DIRECTOR: JAMES KELTON**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	70.106	71.315
TOTAL PROCUREMENT	35.880	37.796
TOTAL O&M	3.844	2.221
TOTAL OTHER	7.186	8.396
TOTAL ANNUAL LAB	117.016	119.728
TOTAL INHOUSE	79.101	77.158
TOTAL INHOUSE RDT&E	46.955	42.513
ANNUAL OPERATING COST	19.258	20.841

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	228	0	49	179
CIVILIAN	1,188	8	435	753
TOTAL	1,416	8	484	932

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
43,511	116.971	154.748	886.522	1,158.241	32.587	195.919

MISSION

Plan, conduct and report tests on weapons, weapons systems, tracked and wheeled vehicles, fire control and target acquisition equipment, ammo and munitions components, troop support equipment and armor plate for all AMC installations and activities. Provide service support to APG elements and support commands.

CURRENT IMPORTANT PROGRAMS

Family of medium tactical vehicles.
Palletized loading system.
Bradley fighting vehicle systems-A2.
Tactical quiet generator sets.
Cartridge, 105mm, APFSDS-T, XM900E1.

FUNCTIONS/EQUIPMENT/FACILITIES

75,000 acres test area. 22,500 meter range to land impact. 26,000 meter range to water impact. 41 miles of vehicle courses including 27 test/obstacle courses and environmental/conditioning equipment. Chambers for subjecting equipment to salt spray or solar radiation. Isolated vibration test facility for shaking explosive equipment simultaneously with temperature conditioning facility for controlled tests of electronic control and guidance equipment. Frequency source for testing all types of material in high intensity electro-magnetic radiation. Facility for testing armor plate. Velocity and targeting equipment is available for observation during rapid fire of rocket track for controlled terminal ballistic tests. Facility available for tests of special electronic and fire control equipment and related system components. Pulse radiation facility available for radiation test of nuclear effects. Instrumented ranges for vulnerability testing of ground based systems.

CONSTRUCTION ENGINEERING RESEARCH LAB**CHAMPAIGN, IL****CDR: DANIEL WALDO JR****TECH DIRECTOR: LOUIS SHAFFER**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	41.258	45.824
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	12.872	14.161
TOTAL OTHER	2.831	3.115
TOTAL ANNUAL LAB	56.961	63.100
TOTAL INHOUSE	33.408	36.857
TOTAL INHOUSE RDT&E	25.217	27.738
ANNUAL OPERATING COST	7.251	8.980

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	3	0	3	0
CIVILIAN	332	40	214	118
TOTAL	335	40	217	118

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
31	58.800	113.000	27.710	199.510	8.200	30.301

MISSION

Plan and execute research to obtain the best combination of engineering design, construction (including environmental quality requirements), operations and maintenance to provide facilities for the military and the nation at least cost and to disseminate those results.

CURRENT IMPORTANT PROGRAMS

Environmental quality management and systems and training lands restoration.
 Energy conservation and systems for military installations.
 Improved systems for repair and maintenance of military facilities.
 Computer-aided designs for planning, design and management.
 Environmental compliance.

FUNCTIONS/EQUIPMENT/FACILITIES

Controlled environment chambers; ion plating unit; 1,000,000 lb closed-loop material system; scanning electron microscope; semi-auto welding equipment; biaxial shock test machine; NDT facility; vacuum induction furnace; metallographic sample preparation, X-ray diffraction and vacuum spectroscopy system; dynamic tension analysis system; digital recording analysis equipment; HVAC test capabilities including systems building methods and techniques; computer-based design and construction management techniques; energy conservation and alternative fuel; hardened facilities analysis environment quality management; pollution control abatement; training area maintenance management and restoration; mobilization facilities; energy research; physical security; and corrosion control.

DUGWAY PROVING GROUND**DUGWAY, UT****CDR: COL FRANK J. COX****DIRECTOR: MR. WILLIAM J. HASLEM**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	49.892	43.800
TOTAL PROCUREMENT	0.950	0.200
TOTAL O&M	1.280	5.297
TOTAL OTHER	26.521	29.343
TOTAL ANNUAL LAB	78.643	78.640
TOTAL INHOUSE	49.477	50.651
TOTAL INHOUSE RDT&E	28.773	24.176
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	126	0	22	104
CIVILIAN	649	17	103	546
TOTAL	775	17	125	650

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
802,724	125.603	181.544	2,133.288	2,440.435	93.000	69.400

MISSION

Dugway Proving Ground (DPG) plans, conducts, and reports on approved tests to assess the military value of chemical weapons, smoke/obscurant and chemical-biological defense systems. Tests support R&D and provide basis for development of new operational and log concepts for employment of tested systems.

CURRENT IMPORTANT PROGRAMS

Conducts service development of chemical/chemical-biological defense smoke/obscurant test programs. Conducts R&D and lab investigations necessary to support mission. Conducts joint-operations chemical and chemical-biological defense tests and studies for CINCs and services. Conducts munitions development/acceptance and production testing. Conducts environmental studies to support DPG and Army programs.

FUNCTIONS/EQUIPMENT/FACILITIES

Instrument grids for chemical/chemical-biological and smoke/obscurant systems. Artillery range for conventional and chemical metal parts. Acquire ballistics and disseminate test with field sample, sample mass analysis, meteorological (auto data acquisition and MESOMET network) system. TSPI (radar slave photo) system. Physical and environmental test facility (mil spec 810) chambers for total agent containment. Operations supported by meteorological research on behavior of clouds. Chemical, life science technology, ecological survival of DPS. Capability for planning analysis, evaluation of tests, operations research, labs equipped for wide range of chemical, microbiological, toxicological, immunological, ecological, poll center studies. Technical and mass array of fluorescent air tracers. External communication and range safety system. Outstanding features are large land area, restricted air space, long and flat artillery ranges, projectile recovery, sonic and electromagnetic sterility, diverse technical and scientific skills.

CDR: COL JEROME G. HERSH TECH DIRECTOR: MR. GRADY H. BANISTER, JR

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1999 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	28.967	28.635
TOTAL PROCUREMENT	4.372	5.008
TOTAL O&M	5.446	5.461
TOTAL OTHER	22.973	21.824
TOTAL ANNUAL LAB	61.758	60.928
TOTAL INHOUSE	33.246	32.104
TOTAL INHOUSE RDT&E	11.713	11.454
ANNUAL OPERATING COST	11.744	11.007

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	569	0	68	501
CIVILIAN	227	2	133	94
TOTAL	796	2	201	595

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
34,345	239.909	18.500	1.448	259.857	21.738	18.772

MISSION

Plan, conduct, evaluate and report on development testing on C3I, optical, Electro-Optical (EO), Electronic Warfare (EW), avionics and tactical intelligence systems. Also heavily involved in supporting operational testing. Maintain modern test facility, instruments, and methodology capability.

CURRENT IMPORTANT PROGRAMS

Guardrail common sensor.
Global Positioning System (GPS).
All Source Analysis System (ASAS).
Joint Tactical Information Distribution System (JTIDS).
Unmanned Aerial Vehicle (UAV).

FUNCTIONS/EQUIPMENT/FACILITIES

Conducts integrated methods of system testing consisting of a computer modeling simulation environment, a hardware-in-the-loop environment, and a controlled field test environment. Operates an electromagnetic environment test facility, an instrumented test range, a system interoperations and computer software test facility and a realistic battlefield EM environment facility. Access to extensive real estate. Antenna test measurement, outdoor compact range, EMI/EMC/EMV, Tempest, TEM cell/reverb chamber, test item simulators, MSAT, auto voice scoring facility, stress loading facility, radar tracking, mobile instrument and real-time, CAD, optical/electro-optical facility, radiological test facility, environmental test facility using latest Mil-Std-461D, RAM/LOG supportability and manprint design quality. Tests for Army, other services, DOD and non-DOD agencies.

DIR: DR. C.G. THORNTON

DEPUTY DIRECTOR: HAROLD BORKAN

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	81.794	0.000
TOTAL PROCUREMENT	2.533	0.000
TOTAL O&M	3.147	0.000
TOTAL OTHER	1.093	0.000
TOTAL ANNUAL LAB	88.567	0.000
TOTAL INHOUSE	21.662	0.000
TOTAL INHOUSE RDT&E	19.403	0.000
ANNUAL OPERATING COST	2.130	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	1	0	1	0
CIVILIAN	301	42	227	74
TOTAL	302	42	228	74

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	92.040	47.000	2.000	141.040	0.000	6.340

MISSION

Develop and transition critical electronic technologies and devices into present and future generation Army systems; millimeter waves, microwaves, pulse power, microelectronics, analog signal processing, frequency control, displays, and tactical power sources.

CURRENT IMPORTANT PROGRAMS

Optically Advanced Switch (OAS).
 Parts obsolescence avoidance for SINCGARS.
 Low cost focal plane arrays.
 Rechargeable lithium battery.
 VHSIC phase II program.

FUNCTIONS/EQUIPMENT/FACILITIES

Pulse power center provides a secure facility for RDT&E of extremely high energy pulse power conditioning components that are necessary to achieve 2-3 orders of magnitude increase in energy delivered by pulse power conditioning components and subsystems for directed energy weapons, electromagnetic and electrothermal guns, and electric drive vehicles. The state-of-the-art class 10-100 microfabrication center serves the broad spectrum of DOD/Army electronic needs such as: Application Specific Integrated Circuits (ASIC), Surface Acoustic Wave (SAW) devices. Microwave/millimeter-wave Monolithic Integrated Circuits (MIMIC), display devices and many IR&D materials/processes programs.

CDR: COL DAVID F. MAUNE

TECH DIRECTOR: MR. WALTER E. BOGE

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	76.577	51.792
TOTAL PROCUREMENT	0.167	0.498
TOTAL O&M	12.479	11.637
TOTAL OTHER	2.492	5.663
TOTAL ANNUAL LAB	91.715	69.590
TOTAL INHOUSE	22.061	26.144
TOTAL INHOUSE RDT&E	14.574	15.836
ANNUAL OPERATING COST	5.214	5.730

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	12	1	6	6
CIVILIAN	383	19	254	129
TOTAL	395	20	260	135

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	121.772	9.749	36.998	168.519	22.400	15.010

MISSION

R&D in topographic sciences (mapping, point positioning, geographic information, remote sensing and digital image exploitation), and scientific advisory services in environmental effects data image interpretation, and operational terrain analysis.

CURRENT IMPORTANT PROGRAMS

Support to Army space program office for Desert Shield.
Development of combat terrain information system for PEO CCS.
Air-land battlefield environment demonstration system.
Image exploitation system balanced technology initiative.
Multispectral signatures for counter-narcotics program.

FUNCTIONS/EQUIPMENT/FACILITIES

Facilities include a computer image generation facility to study and demonstrate computer techniques for 3-D perspective display of topographic information for mission planning, rehearsal and command and control; a digital image processing facility with advanced displays and digital image analysis capabilities; an advanced computer vision test bed for generating image understanding methodology for locating enemy formations from imagery; an artificial intelligence test bed for developing automated image analysis and feature extraction techniques; and special measurement equipment permitting the gathering of hyperspectral data elements for advanced imaging systems development. Computer systems include Cyber 170/730 DEC VAX models 750/780/785, MILVAX II, Encore, Connection Machine II.

CDR: COL L.B. FULTON

TECH DIRECTOR: DR. R.W. WHALIN

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	61.367	63.425
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	1.420	0.539
TOTAL OTHER	76.868	84.036
TOTAL ANNUAL LAB	139.655	148.000
TOTAL INHOUSE	83.248	91.117
TOTAL INHOUSE RDT&E	36.575	37.801
ANNUAL OPERATING COST	17.397	17.350

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	21	3	13	8
CIVILIAN	1,517	137	722	795
TOTAL	1,538	140	735	803

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
3,073	1,798.808	353.645	176.809	2,329.262	60.141	66.700

MISSION

Military and civilian R&D in hydraulics, ecology, coastal engineering, pavements, rock, concrete, soil, weapon effectiveness, vehicle mobility, countermobility, and environmental effects of military operations. Operate technical library and information analysis centers. Government cement pozzolan test program serves DOD, EPA and other federal agencies.

CURRENT IMPORTANT PROGRAMS

Physical and numeric modeling to solve river, coastal, ecological, environmental and structural problems. R&D of cement materials, mass/structure conc, compressed structure engineering construction methods, new pavements and foundations, design of protective and hardened facilities. R&D of weapons and environmental effects, barriers and obstacles, logistics support. R&D of vehicle mobility, fixed facility camouflage, military hydrology, mine locating and neutralization.

FUNCTIONS/EQUIPMENT/FACILITIES

Does general investigation in hydraulics, soil and rock conditions, vehicle mobility, weapons effectiveness, ecology coastal engineering, mine/countermine, camouflage, materials and equipment testing, protective structures, structural pavement, foundation designs, earthquake engineering, aquatic pl construction. WES owns buildings, test sites, special and other plant and support equipment in-house and at other leased areas. Facilities: hydraulic flumes; wave generators; ship navigation simulator; state-of-the-art water quality; soils, chemical, calibration, environmental and limnology labs; numeric and physical modeling capabilities in hydraulic coastal and structural engineering; mobility test facility; 1 million lb dynamic load machine; wheeled load carts; blast effects test facility; high and low frequency vibrators; electron beam microscope; Army super computer facility and technical library; printing plant with MSU, LSU. Tamu WES established an in-house graduate level training institute.

DIR: DONALD B. DINGER

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	83.480	80.645
TOTAL PROCUREMENT	9.477	5.850
TOTAL O&M	3.739	5.358
TOTAL OTHER	7.254	2.699
TOTAL ANNUAL LAB	103.950	94.552
TOTAL INHOUSE	57.972	50.919
TOTAL INHOUSE RDT&E	44.307	42.741
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	3	0	1	2
CIVILIAN	673	42	402	271
TOTAL	676	42	403	273

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
2,316	503.364	12.053	121.717	637.134	56.111	62.223

MISSION

Responsible for technology base program, technology demonstrations and technology leadership in assigned mission areas in order to insure technology insertion, perform engineering development, production support and troop support on a selective basis.

CURRENT IMPORTANT PROGRAMS

Nuclear survivability technology.
 High power microwave technology.
 Electronic fusing and self-contained munitions.
 Information and signal processing.
 Advanced radar technology.

FUNCTIONS/EQUIPMENT/FACILITIES

Nuclear facilities: gamma ray simulator (AURORA), High Intensity Flash X-ray (HIFX), electromagnetic pulse simulators. Electronic design facility: thick hybrid circuit facility, microelectronic design facility. Microwave anechoic chambers, fuze test facilities, artillery simulators, environmental testing. Blossom Point Test Area.

DIR: DR. JOHN D. WEISZ

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	23.263	22.000
TOTAL PROCUREMENT	0.337	0.400
TOTAL O&M	0.411	0.400
TOTAL OTHER	0.000	0.000
TOTAL ANNUAL LAB	24.011	22.800
TOTAL INHOUSE	15.030	15.775
TOTAL INHOUSE RDT&E	14.291	15.000
ANNUAL OPERATING COST	6.200	6.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHLS	TOTAL PROF	NON- PROF
MILITARY	31	3	14	17
CIVILIAN	221	19	130	91
TOTAL	252	22	144	108

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
72	111.524	7.056	21.400	139.980	14.000	26.000

MISSION

Conducts basic and applied research in Human Factors Engineering (HFE). Provides technical advice and counsel to assure that Army material conforms with the capabilities and limitations of soldiers. Provide direct HFE support to AMC TRADOC centers and schools.

CURRENT IMPORTANT PROGRAMS

Robotics/logistics R&D/artificial intelligence (AI).
 HFE support to individual soldier, fire support, air/counter air, armor.
 Command and control/soldier-machine interface/ATR/HFE modeling.
 HFE applications/manprint.
 Soldier performance basic research.

FUNCTIONS/EQUIPMENT/FACILITIES

Robotics, indoor and outdoor research courses, fire control research facility, ACE computer facility, command post exercise facility, human factors howitzer test bed, GAT 2M helicopter simulator, acoustical and anechoic chamber reverberant room, helfast logistics testing facilities, mobility/portability course, small arms test firing range, oculometer/eye movement facility, wood and metal working test support capability.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	5.063	3.602
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	2.347	2.417
TOTAL ANNUAL LAB	7.410	6.019
TOTAL INHOUSE	5.679	4.952
TOTAL INHOUSE RDT&E	3.332	2.535
ANNUAL OPERATING COST	0.937	0.746

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	58	16	39	19
CIVILIAN	18	3	7	11
TOTAL	76	19	46	30

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	18.170	5.696	1.200	25.066	0.000	6.113

MISSION

Conduct research on treatment of combat facial injuries, infections, field dental emergencies, synthetic and allogenic materials for use as implants to replace lost hard and soft tissue, field dental equipment and materials, and techniques for rapid diagnosis of chemical casualties.

CURRENT IMPORTANT PROGRAMS

Hand held X-ray, electro-optical dental X-ray
 Microencapsulated antibiotics.
 Computer assisted postmortem identification system.
 Polymer/medicament and decalcified bone systems for human implantation.
 Antibiotic wound dressings.

FUNCTIONS/EQUIPMENT/FACILITIES

Buildings 40 and 91 at Walter Reed Army Medical Center, Washington, DC; buildings 2801, 2802, 2804, 2805, 2810, 2831, 2832, at Ft. George G. Meade, MD; microscopes - SEM - TEM; fluorescent microscope with videoplan system; gas chromatograph mass spectrometer with data systems; FTIR infrared analyzer; NMR spectrometer; image intensifier quatimet; microtome system for tissue; liquid and gas chromatographs; atomic absorption spectrometers.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	5.575	6.715
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.015
TOTAL OTHER	6.413	5.976
TOTAL ANNUAL LAB	11.988	12.706
TOTAL INHOUSE	11.988	12.596
TOTAL INHOUSE RDT&E	5.575	6.605
ANNUAL OPERATING COST	1.278	1.102

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	153	17	56	97
CIVILIAN	78	4	23	55
TOTAL	231	21	79	152

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
1	26.424	1.800	22.400	50.624	6.958	6.542

MISSION

Investigate problems of mechanical and thermal injuries with their complications, care for patients with such injuries, teach and train other personnel in the management of such patients, and conduct investigative studies at both the basic and clinical levels.

CURRENT IMPORTANT PROGRAMS

Improvement in the survival of severely burned patients.

Improved treatment of inhalation injury.

Identification of blood borne indicators of infection.

Anti-bacterial and wound healing effects of silver nylon electrodes with weak direct current.

H/F vent in patients with inhalation injury.

FUNCTIONS/EQUIPMENT/FACILITIES

Operate forty-bed tertiary care burn unit. Clinical laboratory support and research capabilities in fields of surgical burn care, microbiology biochemistry, endocrinology. Maintain animal colony for basic and applied research. Aeromedical burn teams for the stabilization and transfer of seriously burned patients. Clinical laboratory and pathology facilities for the support of the burn unit. Computer facilities to support the research, clinical and administrative functions of the institute. Bioengineering machine shop for support of research and clinical operations. Provision of physical and occupational therapy for burn patients. Epidemiological surveillance of burn patients. Operation of a thermal injury oriented medical library. Audio-visual support of research and clinical operations.

CDR: COL DONALD G. CORBY

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	14.097	11.010
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.054	0.057
TOTAL OTHER	6.545	5.161
TOTAL ANNUAL LAB	20.696	16.228
TOTAL INHOUSE	16.242	13.707
TOTAL INHOUSE RDT&E	9.643	8.489
ANNUAL OPERATING COST	2.048	3.240

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	113	41	96	17
CIVILIAN	107	20	62	45
TOTAL	220	61	158	62

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
9	128.960	56.941	138.700	324.601	52.353	15.768

MISSION

To conduct medical research in bioeffects of eye protection against lasers, blood preservation, blood substitutes, extended fresh and frozen blood storage, resuscitation methods for use in forward areas, forward area casualty care, and conventional blood storage.

CURRENT IMPORTANT PROGRAMS

Determination of safe thresholds of laser radiation care.
 Resuscitation solutions for use forward of definitive medical care.
 Nuclear magnetic resonance spectroscopy of ocular trauma and treatment.
 Forward care of traumatic shock and missile injuries.

FUNCTIONS/EQUIPMENT/FACILITIES

Separation and analysis labs to include mass spectrometry, gas and high performance liquid chromatography. Surgical suites with on-line multichannel physiologic monitors. Germ-free and open animal facilities housing many species from nude mice to sub-human primates. Computers for administrative and technical/scientific data analysis. General research labs fully equipped with spectrometers, gamma and scintillation counters transmission, scanning and electron microscopes, cold room for fractionation, etc.

CDR: MAJ MELVIN E. ADAMS

TECH DIRECTOR: DR. EDWARD S. WRIGHT

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	33.851	0.000
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	3.156	0.000
TOTAL OTHER	0.042	0.000
TOTAL ANNUAL LAB	37.049	0.000
TOTAL INHOUSE	23.919	0.000
TOTAL INHOUSE RDT&E	22.321	0.000
ANNUAL OPERATING COST	3.576	3.883

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	7	1	5	2
CIVILIAN	529	67	236	293
TOTAL	536	68	241	295

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
48	424.773	42.011	22.133	488.917	27.132	4.543

MISSION

Materials and mechanics programs to complement and leverage private sector, coordinate AMC materials R&D, provide advice and technical assistance, support AMC MSC's and project managers through programs, failure analysis and technical assistance, Army expertise center in composites, corrosion center of excellence.

CURRENT IMPORTANT PROGRAMS

Composite infantry fighting vehicle.
Advanced armor/anti-armor.
Composites/ceramics.
Advanced engine materials.
Chemical protection.

FUNCTIONS/EQUIPMENT/FACILITIES

In-house expertise and facilities are available for synthesis of new and improved materials and designs and the prototyping and manufacture of components for Army weapon systems. Metal processing equipment includes casting, forging, rolling, heat treating, joining, plating, isostatic pressing, vacuum arc melting, machining. Ceramic processing: slip cast, hot pressing, sintering and gradient furnace crystal growth. Polymer/composite processing: injection molding, laminating, tape lay-up vacuum forming, film forming, filament winding, pultrusion, foam processing, pilot polymer production. Quality control and NDT capability, ultrasonics, X-ray, neutron radiography, spectroscopy, holography, chemical analysis, metallography and optics. Uranium and beryllium machining, ballistic ranges, powder characterization and processing.

DIR: MR. KEITH A. MYERS

DEP DIRECTOR: COL RICHARD E. HULL

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	33.250	32.597
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	4.993	7.139
TOTAL OTHER	8.983	10.423
TOTAL ANNUAL LAB	47.226	50.159
TOTAL INHOUSE	27.945	31.868
TOTAL INHOUSE RDT&E	22.834	24.018
ANNUAL OPERATING COST	4.632	4.387

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	28	0	14	14
CIVILIAN	432	12	379	53
TOTAL	460	12	393	67

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
4	8.140	1.276	1.715	11.131	2.870	2.500

MISSION

Develop for Army a basis of information and understanding, primarily concerning system performance, effectiveness, reliability, support and integration in terms of capabilities and limitations leading to decisions which provide the Army with the proper material.

CURRENT IMPORTANT PROGRAMS

Forward Area Air Defense Systems (FAADS).

Deep Fires Systems.

Armored Gun System (AGS).

Bradley Fighting Vehicle System (BFVS).

All Source Analysis System (ASAS).

FUNCTIONS/EQUIPMENT/FACILITIES

AMSAA mission capabilities include: material systems analysis; item level performance analysis; weapon system effective estimates for cost and operational effectiveness analysis; technical and live fire test design; independent technical evaluation of major and designated non-major systems; methodology and computer simulation development; system life cycle surveillance and overview; primary source of technical data for major Army studies; general systems analysis for development of decision information; independent integrated logistical support evaluations for determination of Army staff positions; field exercise and sample data collection, inventory modeling; general logistics, provisions, support and readiness analysis; and coordination of joint munitions effectiveness methodology and data (joint technical coordinating group).

CDR: COL CARL E. PEDERSEN, JR

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	38.711	34.030
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	1.498	1.040
TOTAL ANNUAL LAB	40.209	35.070
TOTAL INHOUSE	5.276	4.590
TOTAL INHOUSE RDT&E	3.778	3.550
ANNUAL OPERATING COST	0.544	0.544

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	20	8	15	5
CIVILIAN	36	8	14	22
TOTAL	56	16	29	27

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	0.000	12.864	0.220	13.084	0.532	0.104

MISSION

Exercise full line authority over the life cycle integrated material management of all assigned systems and/or products in achieving a balanced program to accomplish the material developer's stated objective.

CURRENT IMPORTANT PROGRAMS

Skin decontaminant kit: XM291.
 Resuscitation fluids production systems.
 Filmless digital imaging network.
 Human monoclonal antibody.
 Rapid identification system.

FUNCTIONS/EQUIPMENT/FACILITIES

(None reported)

CDR: MG PHILLIP K. RUSSELL

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	18.423	25.305
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	4.517	0.041
TOTAL OTHER	8.037	8.750
TOTAL ANNUAL LAB	30.977	34.096
TOTAL INHOUSE	12.040	15.275
TOTAL INHOUSE RDT&E	6.203	9.584
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	60	18	54	6
CIVILIAN	184	4	27	157
TOTAL	244	22	81	163

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	0.000	39.000	0.000	39.000	1.800	3.800

MISSION

Administration and coordination of the Army medical RDT&E program. Program limited to unique military problems within the United States and OCONUS.

CURRENT IMPORTANT PROGRAMS

Care of the wounded.
 Prevention and control of infectious diseases.
 Enhancement of military performance.
 Protection against military environmental hazards.
 Development of medical defense against chemical and biological warfare.

FUNCTIONS/EQUIPMENT/FACILITIES

Serves as an administrative headquarters for the Army Medical Department.

CDR: COL MICHAEL A. DUNN

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	26.271	21.338
TOTAL PROCUREMENT	0.000	0.004
TOTAL O&M	0.317	0.612
TOTAL OTHER	4.031	4.445
TOTAL ANNUAL LAB	30.619	26.399
TOTAL INHOUSE	22.238	20.565
TOTAL INHOUSE RDT&E	17.890	15.504
ANNUAL OPERATING COST	3.474	3.416

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	81	15	43	38
CIVILIAN	208	34	104	104
TOTAL	289	49	147	142

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
31	40.246	29.145	95.029	164,420	9.548	20.852

MISSION

Fundamental research on mechanisms of action: Chemical Warfare Agents (CWA), antidotes and pretreatment. Development of pretreatment, antidote drugs and decontaminants against CWA. Develop and evaluate prevention, resuscitation, treatment and management methods for chemical casualties and assist in their implementation.

CURRENT IMPORTANT PROGRAMS

Basic research on CWA and medical countermeasures.
Biomedical effects of CWA and candidate medical countermeasures.
Safety and efficiency of candidate preventive countermeasures.
Analytical technology for medical countermeasures.
Advanced studies of casualty care technology.

FUNCTIONS/EQUIPMENT/FACILITIES

Chemical casualty care training, physiology, drug assessment, pharmacology, analytical chemistry, neurotoxicology, veterinary surgery, chemical safety/surety, medical maintenance, supply and quality assurance. Technical library with 6,000 books, 1,000 journal titles, many data bases. Video facility and computer facility and 7,000 sq.ft. animal facility. Radioisotope chemical antidote and biochemical analysis, histochemistry behavioral testing, drug screening, pharmacokinetics, molecular modeling, liquid, gas, column and affinity chromatography, quantitative image enhancement/analysis, electrophoresis, spectroscopy, fluorometry and spectropolarimetry GC mass spectrometry, electron spin resonance and peptide synthesis/sequencing amino acid analysis, monoclonal hapten antibodies, agent vaccines, electron, scanning and X-ray microscopy, cell cloning, receptor analysis.

CDR: COL DAVID L. HUXSOLL DEP FOR SCIENCE: DR. MICHAEL A. CHIRGOS

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	49.719	44.949
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.256	0.221
TOTAL OTHER	11.556	11.058
TOTAL ANNUAL LAB	61.531	56.208
TOTAL INHOUSE	38.682	36.259
TOTAL INHOUSE RDT&E	26.870	25.000
ANNUAL OPERATING COST	2.507	1.820

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	285	52	107	178
CIVILIAN	282	42	114	168
TOTAL	567	94	221	346

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
388	104.136	26.618	205.841	336.595	21.430	33.190

MISSION

To develop strategies, products, information and training for medical defense against biological warfare agents and naturally occurring infectious agents of military importance that require special containment.

CURRENT IMPORTANT PROGRAMS

Demonstrated feasibility of Vaccinia virus as an expression vector.
 Discovered common antigenic properties using snake venom to devise diagnosis.
 Developed methodologies for rapid identification and diagnosis.
 Demonstrated feasibility of constructing chimeric RNA vaccines.
 Expanded antiviral drug discovery program for future testing and development.

FUNCTIONS/EQUIPMENT/FACILITIES

Medical research conducted in two buildings providing 307,000 sq.ft. and containing 23 modern lab suites with emphasis on biosafety level 3 and 4 (BL-3 and 4) containment. BL-4 operations conducted in positive pressure personnel suites and/or class III microbiological safety cabinets. BL-4 labs are unique resource in world for safe study of high-hazard disease agents with research results published in open science literature. Special 16-bed experimental ward for vaccine and other studies in volunteers. BL-4 containment ward, BL-4 clinical lab and BL-4 isolation transport system provide state-of-the-art medical treatment and diagnosis for most hazardous diseases known. Aerosol assessment, cell culture, electron microscopes, mass spectrometric facility, respiratory mucosal immunity lab, DNA technology, hybridoma lab, coagulation lab, etc.

CDR: MG WILLIAM S. CHEN

TECH DIRECTOR: DR. WILLIAM C. McCORKLE

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	219.538	209.279
TOTAL PROCUREMENT	25.488	26.485
TOTAL O&M	36.842	47.760
TOTAL OTHER	7.595	3.725
TOTAL ANNUAL LAB	289.463	287.249
TOTAL INHOUSE	79.898	124.210
TOTAL INHOUSE RDT&E	60.558	88.391
ANNUAL OPERATING COST	27.000	23.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	81	0	36	45
CIVILIAN	1,707	58	1,215	492
TOTAL	1,788	58	1,251	537

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
15,000	868.000	322.000	210.000	1,400.000	240.000	302.000

MISSION

Provide support for project-managed systems. Manage and conduct research, exploratory and advanced development for missiles, rockets, directed energy weapons and unmanned aerial vehicles. Provide technical solutions to Army's close combat, fire support and air defense system needs and develop technology for future systems.

CURRENT IMPORTANT PROGRAMS

Advanced Kinetic Energy Missile (ADKEM).
 FOG-X.
 Insensitive Munitions for missile propulsion (IM).
 Multi-Role Survivable Radar (MRSR).
 Demonstration of Advanced Radar Technology (DART).

FUNCTIONS/EQUIPMENT/FACILITIES

The Missile RDT&E Center is equipped to study problems in propulsion, aerodynamics, guidance and control, structures, advanced sensors, and missile system simulation. The major facility is McMorrow laboratory which houses the majority of the center. Some unique facilities are: advance simulation center; a computer complex surrounded peripherally by three (3) environmental effects simulators; missile computer software/hardware center; lighting test facility; Army missile optical range. The center maintains and operates seven (7) major test areas which encompass flight static, environmental and functional testing. The center also utilizes state-of-the-art facilities and equipment such as laser tracers and electro-magnetic radar sensors. The center performs as Army lead center in guidance and control/terminal homing technology. Lead for Smart Munitions.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	75.339	112.089
TOTAL PROCUREMENT	8.541	32.133
TOTAL O&M	15.505	25.222
TOTAL OTHER	15.766	9.883
TOTAL ANNUAL LAB	115.151	179.327
TOTAL INHOUSE	73.056	79.968
TOTAL INHOUSE RDT&E	40.225	52.583
ANNUAL OPERATING COST	14.822	15.395

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	820	2	36	784
CIVILIAN	901	56	405	496
TOTAL	1,721	58	441	1,280

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
174	354.428	114.463	343.336	812.227	29.932	30.636

MISSION

Provide R&D and Engineering required for technical support of assigned fielded military equipment and for application of technologies for field organization equipment, sustainment (food, field feeding systems and airdrop systems), and for protection of personnel and equipment (protective clothing, shelters, etc).

CURRENT IMPORTANT PROGRAMS

Integrated protection for soldier from multi threats including C/B, DEW, etc.

Lightening the soldier's load; improved soldier performance.

Combat field feeding systems.

NBC hardened shelters; C/B protected tentage; advanced field organization equipment systems. Advanced personnel and cargo airdrop system.

FUNCTIONS/EQUIPMENT/FACILITIES

Biotechnology lab, materials characterization lab, polymer science lab, ballistic polymer lab, microscopy lab, sensory evaluation lab, food processing lab, food packaging lab, food systems equipment lab, dyeing and finishing lab, airdrop static test facilities, EMI measurement facility, and sterile transfer room. Helium-neon, CO₂, YAG pumped tunable picosecond and multiwavelength nanosecond lasers. X-ray analyzer, lambda nine spectrophotometer, oligonucleotide synthesizer, peptide synthesizer, autograph and spectrometers, including quadruple mass, fast scanning, triple scanning, triple stage quadruple mass, Fourier transform IR scanning UV/IR, NMR and photoacoustic. Climatic chambers. Ultralight aircraft for conducting model parachute tests. Automated respirometry system. Rotaviscometer. Langmuir-Blodgett facilities. COD imaging system.

CDR: COL MICHAEL D SHALER

TECH DIRECTOR: EDGAR M JOHNSON

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	66.515	49.494
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	1.143	0.701
TOTAL OTHER	1.866	1.674
TOTAL ANNUAL LAB	69.524	51.869
TOTAL INHOUSE	26.348	25.163
TOTAL INHOUSE RDT&E	24.137	23.303
ANNUAL OPERATING COST	12.688	11.276

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	16	1	16	0
CIVILIAN	313	146	193	120
TOTAL	329	147	209	120

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	53.355	14.000	6.100	73.455	0.807	3.829

MISSION

Maximize combat effectiveness through timely research in the accession, training, use and retention of soldiers. Support decision making by Army leaders through personnel performance and training RDT&E programs.

CURRENT IMPORTANT PROGRAMS

Soldier performance under stress.
 Delayed Entry Program (DEP) attrition model.
 Enlistment forecasting model (revised).
 Final Enlisted Personnel Allocation System (EPAS).
 Joint service test battery incorporating six psychomotor/spatial tests.

FUNCTIONS/EQUIPMENT/FACILITIES

The principle Army agency conducting soldier-related research and development. Consists of three research laboratories and a basic research office. The laboratories are comprised of technical areas: selection and classification; special selection; personnel utilization; manpower and personnel policy; executive development; manprint coordination manned system; technologies for skill acquisition and retention automated instructional system; leadership and motivation. Field units and scientific coordination offices located at Presidio of Monterey; Ft. Benning; Ft. Knox; Ft. Rucker; Ft. Bliss; Ft. Hood; Ft. Leavenworth; Orlando; Ft. Huachuca; OTEA; AVSCOM; and Boise. In-house experimental facilities lab and computer terminal area permitting real-time experimentation, gaming and simulation.

CDR: COL JOSEPH C. DENNISTON

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	8.016	7.676
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.018	0.588
TOTAL OTHER	2.822	3.096
TOTAL ANNUAL LAB	10.856	11.360
TOTAL INHOUSE	10.046	10.738
TOTAL INHOUSE RDT&E	7.206	7.054
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	76	17	30	46
CIVILIAN	92	29	51	41
TOTAL	168	46	81	87

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	38.454	5.960	33.750	78.164	4.084	11.647

MISSION

Conduct research to determine the effects of heat, cold, high terrestrial altitude, nutrition and work upon the soldiers life process, performance and health. Defense interaction of environmental stresses.

CURRENT IMPORTANT PROGRAMS

Demonstrated the effectiveness of pharmaceutical and nutritional interventions in reducing the incidence and severity of acute mountain sickness. Conducted human performance, physiological tolerance and safety assessment of chemical defense material in support of material and combat developers - pretreatment - antidotes - MOPP - microclimate cooling - drinking systems.

FUNCTIONS/EQUIPMENT/FACILITIES

The major equipment and facility capabilities of the laboratory include, but are not limited to: two (2) large altitude chambers, fourteen (14) small climatic chambers, AAALAC accredited animal care facilities, electron microscope, underwater research pool, copper manikins, and diverse pharmacological and psychological measuring equipment. The institute maintains a field facility on the summit of Pikes Peak, CO.

ACT DEP CDR: WAYNE WHEELOCK

ACT DEP DIR: ALEXANDER FARKAS

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	64.460	67.300
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	31.187	46.059
TOTAL OTHER	0.262	0.262
TOTAL ANNUAL LAB	95.909	113.621
TOTAL INHOUSE	37.854	60.088
TOTAL INHOUSE RDT&E	19.301	36.430
ANNUAL OPERATING COST	12.800	12.200

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	31	1	19	12
CIVILIAN	869	22	492	377
TOTAL	900	23	511	389

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
11	246.562	23.756	125.274	395.592	278.159	163.516

MISSION

Plan, manage, and conduct research exploratory/advanced development and overall system integration for ground vehicles. Provide engineering support for fielded systems and for procurement of new equipment. Manage configuration and technical data for tank-auto equipment. Provide S&E support to TACOM PEO's and AMC/DOD elements.

CURRENT IMPORTANT PROGRAMS

Armored combat vehicle development and Vehicle Electronics (VETRONICS) integration.
Advanced Integrated Propulsion System (AIPS).
Component Advanced Technology Test Bed (CATTB).
Combat vehicle survivability and armor integration.

FUNCTIONS/EQUIPMENT/FACILITIES

Perform laboratory development and testing of track, suspension and complete propulsion systems to include environmental heat testing. Conceptualize, design and fabricate components or complete vehicles inhouse. Effectively integrate the vehicle electrical and electronic subsystems while optimizing the soldier/machine interface. Adapt and integrate survivability technologies, components and techniques before vehicle concept design and integrate them with the armor arrays provided by Army laboratories. Conduct physical simulations on a four degree of freedom motion based simulator to determine component interaction and man/machine interface. Integrate all other AMC contractor developed technologies into concept designs for future combat and tactical vehicle systems.

CDR: MG WILLIAM C. PAGE, JR

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	57.226	58.000
TOTAL PROCUREMENT	4.000	4.000
TOTAL O&M	63.513	62.000
TOTAL OTHER	52.765	38.215
TOTAL ANNUAL LAB	177.504	162.215
TOTAL INHOUSE	162.504	147.215
TOTAL INHOUSE RDT&E	57.226	58.000
ANNUAL OPERATING COST	23.284	24.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	1,398	0	195	1,203
CIVILIAN	904	1	231	673
TOTAL	2,302	1	426	1,876

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
22	19.900	41.000	0.000	60.900	6.300	3.000

MISSION

Execute force development and follow-on operational tests. Conduct field experimentation early user tests, initial operational tests and concept evaluations. Conduct field validation of new organizations and operational concepts. Develop and procure instrumentation.

CURRENT IMPORTANT PROGRAMS

Anti-armor.
 Artillery effects.
 Light division concept.
 Close air.
 Urban warfare.

FUNCTIONS/EQUIPMENT/FACILITIES

Position location, high agility modular integrated target, video, data acquisition and reduction, thermal imaging, fiber optics and video multiplexer/demultiplexer, range timing, microwave, environmental measurement and survey.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	42.240	0.000
TOTAL PROCUREMENT	10.173	0.000
TOTAL O&M	0.976	0.000
TOTAL OTHER	14.129	0.000
TOTAL ANNUAL LAB	67.518	0.000
TOTAL INHOUSE	19.924	0.000
TOTAL INHOUSE RDT&E	17.804	0.000
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	61	0	12	49
CIVILIAN	247	5	147	100
TOTAL	308	5	159	149

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
1,316	86.737	49.491	99.332	235.560	11.023	104.000

MISSION

Conduct independent electronic warfare vulnerability assessments of U.S. Army combat and combat support systems and of foreign systems. Research, demonstrate and recommend electronic counter-countermeasures to system developers.

CURRENT IMPORTANT PROGRAMS

EW hardened 50 combat systems with more than 75 ECCM recommendations.
 Conducted first ever semi-investigation of ar. RF system.
 Developed Desert Shield fact sheets detailing EW do's/don't for deployed forces.
 Investigated unique RF obscurant that may increase weapon survivability.
 Developed optical material that may result in ECCM technique for sensors.

FUNCTIONS/EQUIPMENT/FACILITIES

The electro-optical countermeasures simulation facility performs real-time hardware-in-the-loop missile flight simulations for evaluating missile performance in a countermeasure environment. The Army Airborne Electronic Warfare laboratory consists of a USAF NKC-135A aircraft with on board jammers/chaff/flares used to create a countermeasures environment for vulnerability assessment of DOD systems. The signature measurements and data reduction facility conducts infrared spectral and ultraviolet/infrared imaging measurements in support of electronic warfare programs. The spectral electromagnetic interference facility assesses the effects of electromagnetic interference on military systems. The dynamic analysis laboratory uses hardware-in-the-loop to assess effects of countermeasures on laser guided and infrared Smart Munitions.

DIR: COL C. FRED TYNER

DEP DIRECTOR: COL MICHAEL G. GROVES

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	80.371	93.177
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	6.024	1.129
TOTAL OTHER	22.079	23.529
TOTAL ANNUAL LAB	108.474	117.835
TOTAL INHOUSE	78.057	70.187
TOTAL INHOUSE RDT&E	49.954	45.529
ANNUAL OPERATING COST	12.689	12.079

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	383	98	357	26
CIVILIAN	413	69	260	153
TOTAL	796	167	617	179

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
37	311.100	58.400	73.300	442.800	12.293	37.961

MISSION

Mission is to perform research in the prevention of soldier disability and return to duty of soldiers who do become casualties. This is done by the development of the medical material and doctrine to protect against threats from the natural environment, military weapons, and operations stress.

CURRENT IMPORTANT PROGRAMS

Develop drugs and vaccines to protect against infectious diseases threats.
 Develop means for prevention of operational stress in combat environment.
 Develop methods to prevent sepsis and shock after traumatic injury.
 Develop strategies for protecting soldiers from chemical/biological warfare threats.
 Evaluate military health hazards of Army weapon systems and manpower programs and conditions.

FUNCTIONS/EQUIPMENT/FACILITIES

Complete analytical chemistry capability. Drug development from computer aided design and synthesis to field testing. Vaccine development from basic research through production, testing and licensing. Complete infectious disease diagnosis to include isolation of agents and serological diagnosis. Perform comprehensive human behavioral research studies in the laboratory and in the field. Evaluate health hazards from blast and toxic gases and high-power microwaves. Perform complete epidemiology on military medical threats through pathological evaluation to include transmission and scanning electron microscopy studies. Testing of drugs, vaccines and medical doctrine in overseas field locations in Korea, Brazil, Germany, Thailand, and Kenya.

CDR: BG RONALD V. HITE

TECH DIRECTOR: MR. JOHN A. LOCKERD

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	56.196	55.390
TOTAL PROCUREMENT	25.527	26.538
TOTAL O&M	6.510	6.806
TOTAL OTHER	52.643	31.249
TOTAL ANNUAL LAB	140.876	119.983
TOTAL INHOUSE	54.150	32.723
TOTAL INHOUSE RDT&E	12.433	11.818
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	571	15	507	64
CIVILIAN	2,371	62	1,161	1,210
TOTAL	2,942	77	1,668	1,274

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
2,622,967	1,454.443	676.956	3,048.239	5,179.638	310.972	370.352

MISSION

To provide and operate a tri-service national range, test and evaluate DOD systems and provide installation support.

CURRENT IMPORTANT PROGRAMS

Army-Patriot, FAADS, MIRS, ATACMS, HAWK, HEDI-KITE, and Stinger.

Air Force-AMRAAM, AIM, ALCM, HAVE NAP, SRAM IT and T.

Navy-RAM, SM, SLAM, 16" gun, high-energy laser, and research rockets.

NASA-Shuttle training/operations and tracking data relay satellite systems.

Other-SDIO, DNA, other government and approved foreign government and industry systems.

FUNCTIONS/EQUIPMENT/FACILITIES

WSMR, an all-overland test range, provides tremendous land and air space for missile system/subsystem testing. The range provides internal and external measurement data utilizing secure telemetry and radar, laser tracking, interferometer, optical and instrumentation systems. These systems, the launch complexes, control centers and data processing and display facilities are joined by extensive timing and communications systems. Other capabilities include: experimental payload and missile component recovery; air and ground multiple-target control and geodetic surveying. Other test facilities include: microwave and automated systems; dynamic and climatic environments, chemical, metallurgical, micro- biological, nuclear and electro-magnetic effects; hazardous warheads and explosives bur-is; outdoor electro-optical laboratory.

CDR: COL DONALD D. LOFTIS

TECH DIRECTOR: WILLIAM T. VOMOCIL

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	82.913	69.360
TOTAL PROCUREMENT	12.644	18.309
TOTAL O&M	2.379	5.708
TOTAL OTHER	23.980	14.843
TOTAL ANNUAL LAB	121.916	108.220
TOTAL INHOUSE	71.328	60.438
TOTAL INHOUSE RDT&E	40.883	34.096
ANNUAL OPERATING COST	30.471	30.843

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	294	0	170	124
CIVILIAN	951	3	158	793
TOTAL	1,245	3	328	917

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
837,803	7.616	155.772	1,655.797	1,819.185	83.066	208.244

MISSION

Operate a multi-purpose test range with mission to plan, execute and report tests of aircraft weapons, long-range artillery, military and armored vehicles, tank weapons, munitions and aerial delivery systems. Conduct tests of military equipment in desert terrain and environment.

CURRENT IMPORTANT PROGRAMS

Howitzer improvement program.
 Tank main armament system.
 Sense and destroy armor.
 Family of medical tactical vehicles.
 Palletized load system.

FUNCTIONS/EQUIPMENT/FACILITIES

Two major independent instrumented test ranges, artillery and aircraft. Vehicle mobility courses and obstacles. Environmental simulation facilities labs, shops and other facilities to support the mission. Air delivery drop zones supported by laser trackers, cinetheodolites and versatile tracking mounts connected to a real time data processing system. Restricted use air space areas allow safe conduct of concurrent tests. Automotive test courses for performance, mobility and durability tests. Hard surface airfield and maintenance facility. Paved dynamometer course with mobile dynamometers and support shop physical measurement, X-ray, petroleum and chemical labs. Scientific computer centers with real-time data processing.

DEPARTMENT OF THE NAVY

CO: CAPT A.J. MATECZUN

CHIEF SCIENTIST: DR. C.E. WILLIAMS

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	5.341	5.058
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	0.000	0.000
TOTAL ANNUAL LAB	5.341	5.058
TOTAL INHOUSE	5.341	5.058
TOTAL INHOUSE RDT&E	5.341	5.058
ANNUAL OPERATING COST	2.114	1.981

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	38	10	18	20
CIVILIAN	56	14	32	24
TOTAL	94	24	50	44

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
1	94.040	6.289	19.672	120.001	11.094	10.140

MISSION

Conduct research development test and evaluation in aviation medicine and allied sciences to enhance health safety and readiness of aviation personnel. Conduct RDT&E to assess and improve health and physical tolerances of aviation personnel.

CURRENT IMPORTANT PROGRAMS

Vestibular transduction: motion perception and motion sickness. Effects of biomedical countermeasures on sustained operations. Vision standards. Contact lens usage and evaluation. Night Vision Devices (NVDS). Laser glare effects. Electromagnetic energy to rewarm hypothermic casualties. Physiologic effects of extreme cold exposure. Medical standards for Naval aviation.

FUNCTIONS/EQUIPMENT/FACILITIES

Slow rotation room. Cariolis acceleration platform. Human disorientation device. Still-Werner chair. Off vertical rotating chair. Anechoic reverberant chambers. Automated pulmonary function. Treadmill. Vector echocardiogram. Thermographic imaging system. Synthesized radio frequency signal generators. Portable multichannel telemetry monitor. Five mobile and fixed labs equipped to collect biomedical and cognitive performance data. Dye and ion lasers, three lens color projection system, real-ear attenuation test facility, auditory and psycho-acoustic test facility, high-noise test chamber, Standard Linear Energy Doubler (SLED) device for increasing power for microwave pulses. Psychological test facility. Laser facility, portable cabinets for measuring deposition microwave energy in man-size models, radio communications monitoring station, speech intelligibility.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT + EST)
TOTAL RDT&E	303.454	278.210
TOTAL PROCUREMENT	57.661	60.619
TOTAL O&M	55.487	51.424
TOTAL OTHER	21.307	25.196
TOTAL ANNUAL LAB	437.909	415.449
TOTAL INHOUSE	199.966	209.042
TOTAL INHOUSE RDT&E	197.487	181.949
ANNUAL OPERATING COST	47.995	55.212

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	212	4	54	158
CIVILIAN	2,615	76	1,591	1,024
TOTAL	2,827	80	1,645	1,182

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
839	883.070	103.833	457.341	1,444.244	56.389	158.348

MISSION

To be the principal Navy RDT&E center for Naval aircraft systems, airborne anti-submarine warfare, aircraft systems (less aircraft-launched weapons systems), and surface ship, submarine and aircraft navigation.

CURRENT IMPORTANT PROGRAMS

VP program.
Advanced system sensors.
NAVSTAR.
Operations crew systems.
CV-ASWM.

FUNCTIONS/EQUIPMENT/FACILITIES

Tactical air combat training systems facility, tactical aircraft mission planning system facility, VS and P-3C facilities. Carrier anti-submarine warfare module lab, sonar development simulation facilities, antenna test facility. NAVAIRDEVCON detachment, Key West, FL. Central computer system, inertial navigation facility, ships motion simulation facility. Dynamic flight simulator, structural test facility. George Tsaparas Development Lab. Vertical decelerator, ejection seat tower, air common acoustic processing lab, anti-sub warfare engineering lab. Crew station evaluation facility. TACAIR systems development facility. Hybrid microelectronics lab, NAVSTAR global positioning system lab. TACAMO lab, vertical flight lab.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	52.688	45.424
TOTAL PROCUREMENT	1.654	1.855
TOTAL O&M	0.378	0.496
TOTAL OTHER	9.439	10.394
TOTAL ANNUAL LAB	64.159	58.169
TOTAL INHOUSE	47.391	51.025
TOTAL INHOUSE RDT&E	33.609	36.186
ANNUAL OPERATING COST	13.294	12.907

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	7	0	7	0
CIVILIAN	740	1	227	513
TOTAL	747	1	234	513

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
68	488.390	27.962	92.816	609.168	52.800	13.400

MISSION

Provide technical and engineering services, particularly T&E, for air-breathing propulsion systems, power drive systems, fuels and lubricants. Conduct rigorous testing, investigate and resolve technical problems. Provide comprehensive independent technical evaluation of development and in-service systems and programs. Manage and conduct applied R&D leading to new or improved propulsion systems.

CURRENT IMPORTANT PROGRAMS

F/A-18 E/F engine development program, F107/F112 cruise and advanced missile engine program, F110-GE-400 fleet problem resolution, F404 engineering support and CIP testing, UAV program support F404(T-45) qualification test.

FUNCTIONS/EQUIPMENT/FACILITIES

Three (3) large altitude cells, two (2) large sea level cells and four (4) small altitude cells provide environmental and flight simulation capability of sea level to 100,000 ft, -65° to +350°F, and flight speeds from zero to mach 3 to test turbojet/fan and turboprop/shaft engines. Five (5) test rooms to test starters, accessories and auxiliary power units. Ten (10) test rooms and chemistry lab used for R&D on fuels, lubes and bearings. Special test facilities include: rotor spin facility, helicopter transmission test facility, gyro rig and engine turntable. Facilities are used for R&D on advanced fuels and lubricating oils, oil-wetted engine components, air pollution, low cycle fatigue, containment noise and I/R programs. NAPC qualified oils, manages exploratory and advanced development programs, provides administration and technical direction to selected NAVAIR contracts.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT + EST)
TOTAL RDT&E	225.314	171.518
TOTAL PROCUREMENT	94.665	88.767
TOTAL O&M	97.797	98.226
TOTAL OTHER	81.042	77.555
TOTAL ANNUAL LAB	498.818	436.066
TOTAL INHOUSE	276.510	219.915
TOTAL INHOUSE RDT&E	144.201	98.316
ANNUAL OPERATING COST	77.500	79.091

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	1,420	2	259	1,161
CIVILIAN	2,800	7	980	1,820
TOTAL	4,220	9	1,239	2,981

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
6,889	1,279.290	448.755	4,276.567	6,004.612	1,445.777	162.291

MISSION

Serve as the center of excellence and principal site for aircraft weapon systems development, test and evaluation. Provide technical services for all aircraft weapons systems life cycle processes. Support test and evaluation.

CURRENT IMPORTANT PROGRAMS

AP-3 aircraft program.
V-22 aircraft program.
F-14D aircraft program.
F/A-18 aircraft program.
T-45 aircraft program.

FUNCTIONS/EQUIPMENT/FACILITIES

Provide full scale development production and fleet support and fleet in-service engineering support. Have restricted air space plus direct access to instrumented offshore warning areas, real-time range, aircraft telemetry data processing and data display simulation capabilities for airborne weapons systems. Provide software environmental simulation capabilities for underwater acoustics, electronic warfare, and electromagnetic vulnerability. Effects testing, aircraft gun firing tunnel, electrical system test facility and controlled engine, hydraulic, fuel and environmental electrical test capability. Maintain a catapult and arresting gear and antenna test range.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	3.226	3.509
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	0.190	0.077
TOTAL ANNUAL LAB	3.416	3.586
TOTAL INHOUSE	3.288	3.295
TOTAL INHOUSE RDT&E	3.226	3.295
ANNUAL OPERATING COST	1.272	1.387

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	40	3	10	30
CIVILIAN	41	4	14	27
TOTAL	81	7	24	57

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
1	25.845	23 149	1.276	50.270	0.000	2.271

MISSION

Conduct biomedical research on effects of mechanical forces (motion, vibration, impact) encountered in ships and aircraft by Navy personnel. Establish human tolerance limits for these forces. Develop preventive and therapeutic methods to protect personnel from delirious effects of such forces.

CURRENT IMPORTANT PROGRAMS

Effects of impact acceleration on human neurophysiology. Determine human dynamic response to impact acceleration. Develop safe-unsafe impact acceleration guidelines. Long-term effects of biodynamic stress experiments. Validate human anthropomorphic manikins. Full scale motion simulations. Motion performance degradation metrics. Cognitive performance test in stressful environments.

FUNCTIONS/EQUIPMENT/FACILITIES

Horizontal accelerator, vertical accelerator, disorientation chair, electro-hydraulic shaker, ship motion simulator, machine shop, clinical laboratory, clinical radiographic facility, neurophysiology laboratory, neuropathology laboratory, human performance laboratory, vivarium fiberglass shop, woodworking shop.

CIVIL ENGINEERING LABORATORY**PORT HUENEME, CA****CO: CAPT PAUL A. CHAPLA****TECH DIRECTOR: DR. ROBERT N. STORER**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	25.402	32.168
TOTAL PROCUREMENT	3.268	3.476
TOTAL O&M	11.895	12.113
TOTAL OTHER	15.943	17.096
TOTAL ANNUAL LAB	56.508	64.853
TOTAL INHOUSE	29.554	33.178
TOTAL INHOUSE RDT&E	19.164	21.463
ANNUAL OPERATING COST	8.659	8.112

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	16	0	6	10
CIVILIAN	400	24	236	164
TOTAL	416	24	242	174

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
32	105.322	67.893	47.785	221.000	6.300	9.200

MISSION

To provide innovative technology products and services required to improve the acquisition, operation and maintenance of Navy shore and ocean facilities. Enhance the Seabees and the Marine Corps operational readiness capabilities.

CURRENT IMPORTANT PROGRAMS

Defense environmental restoration program, pollution prevention. Navy shore facilities improvement. Deep ocean technology in support of ASW. Marine Corps amphibious logistics. Navy construction forces systems, ocean test ranges, underwater construction force systems, explosive safety, physical security, independent exploratory device, independent research, U.S. Army, U.S. Air Force.

FUNCTIONS/EQUIPMENT/FACILITIES

Deep ocean simulation laboratory, shallow water dive tank, research motor vessel independence, ballistic test facility for testing security products, metallurgical material laboratory, chemistry laboratory, water purification laboratory, steamboiler laboratory, electromagnetic pulse test facility, environmental protection laboratory, physical security test facility, soils laboratory, heavy equipment test facility, helicopter lift site, high temperature pavements stand.

CLOTHING & TEXTILE RESEARCH FACILITY**NATICK, MA****OIC: CDR W.E. JOHNSON****TECH DIRECTOR: NORMAN AUDET**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	1.335	1.528
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	2.240	2.216
TOTAL OTHER	0.180	0.075
TOTAL ANNUAL LAB	3.755	3.819
TOTAL INHOUSE	3.606	3.532
TOTAL INHOUSE RDT&E	1.048	1.241
ANNUAL OPERATING COST	0.522	0.480

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	1	0	0	1
CIVILIAN	62	1	44	18
TOTAL	63	1	44	19

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	12.660	16.000	5.630	34.290	2.000	2.000

MISSION

Conduct Research, Development, Test and Evaluation and provide engineering support in clothing textiles and related fields associated with Navy dress and protective clothing.

CURRENT IMPORTANT PROGRAMS

Battle dress, CBR clothing material investigations to meet Navy clothing requirements uniform program. Protective clothing and footwear for hazardous environments. Life support systems development for protective clothing. Environmental physiology research and evaluation.

FUNCTIONS/EQUIPMENT/FACILITIES

Hydro-environment temperature lab, air chamber/marine tank reproduces air-sea temperature conditions for water immersion physiology and buoyancy tests. Environmental test chamber for evaluating protective clothing under work stress and extreme temperatures. Instrumented thermal manikin for determining thermal insulation of clothing in wet and dry environments. Thermal flammability apparatus for conducting flame resistance, heat resistance and thermal protection material testing. Chemical and physical testing equipment for evaluating fabrics, yarns, fibers, leather, plastics, rubbers, dyes and finishes. CAD/CAM system for design and grading of clothing patterns. Sewing machines, fusing press for developing sample garments. Pattern drafting equipment.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	123.559	129.846
TOTAL PROCUREMENT	44.476	32.715
TOTAL O&M	20.896	26.440
TOTAL OTHER	8.849	3.457
TOTAL ANNUAL LAB	197.780	192.458
TOTAL INHOUSE	108.450	108.500
TOTAL INHOUSE RDT&E	73.953	77.700
ANNUAL OPERATING COST	30.418	32.598

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	91	0	10	81
CIVILIAN	1,295	58	747	548
TOTAL	1,386	58	757	629

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
648	454.363	67.264	392.155	913.782	76.376	36.996

MISSION

To be the principal Navy RDT&E center for mine and undersea countermeasures, special warfare, amphibious warfare, diving and other Naval missions that take place primarily in the coastal regions.

CURRENT IMPORTANT PROGRAMS

Mine and undersea CounterMeasures (CM).
 Torpedo and sonar countermeasures, submarine launchers (CM unique).
 Ship/airborne mine countermeasures combat system integration.
 Diving, salvage, special warfare, and amphibious warfare.
 Land mine CM and Marine Corps tactical deception.

FUNCTIONS/EQUIPMENT/FACILITIES

Ocean simulation facilities to 2-50' depth, center test range, systems engineering integration facility, underwater weapons systems laboratory and underwater equipment laboratory. Hyperbaric test facility, hydrospace laboratory, magnetic target detection laboratory and class range, software engineering environmental/tactical embedded computers, laser laboratory, advanced technology computational facility, vehicle technology facility, non-magnetic facility, laboratories for transducer devices, materials R&D, acoustic testing, sonar processing, meteorology, instrumentation, oceanography, countermeasure evaluation in real time simulation, active sonar model, computer aided engineering design and manufacturing capabilities, two (2) VAX 11/780 and associated data communications systems, pier space and boats to include research vessels Athena 1 and 2, MSO 443 Fidelity, heliport complex with 2 RH53D, 1 MH53E, 1 NUHIE, and industrial shops.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	273.577	262.361
TOTAL PROCUREMENT	27.272	50.597
TOTAL O&M	64.878	64.646
TOTAL OTHER	38.656	32.956
TOTAL ANNUAL LAB	404.383	410.560
TOTAL INHOUSE	196.085	210.849
TOTAL INHOUSE RDT&E	133.368	139.790
ANNUAL OPERATING COST	66.369	62.869

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	62	2	41	21
CIVILIAN	2,753	122	1,536	1,217
TOTAL	2,815	124	1,577	1,238

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
419	1,748.000	120.000	287.000	2,155.000	86.275	124.800

MISSION

To be the principal Navy Research, Development, Test, and Evaluation (RDT&E) center for naval vehicles and logistics. Provide RDT&E support to the U.S. Maritime Administration and the maritime industry.

CURRENT IMPORTANT PROGRAMS

SSN-21 (Propeller/Bow/Structure/Machinery/Acoustic/Hydrodynamic). Superconducting materials for electric drive, surface ship and submarine silencing (Acoustic/Non-Acoustic/Machinery). Surface ship survivability (Structure/Machinery/Materials).

Unmanned underwater vehicles.

Advanced high water speed amphibious vehicles, propulsion

(Hydrodynamic/MACH/Materials). Aerodynamics (technology and advanced concepts).

FUNCTIONS/EQUIPMENT/FACILITIES

Deep water acoustic facility with shallow/deep water, high speed towing basins, wind and water tunnels, anechoic flow facility, structural evaluation laboratory, underwater explosions barge/test pond, physical metallurgy laboratory, welding/fabrication laboratories, machinery development laboratory, environmental protection laboratory, dynamic control simulator/computer, maneuvering and seakeeping/radio-controlled model facility, pressure tanks. Deep ocean facility high speed research vessels, paint laboratory, fuels laboratory, shock and vibration facility, central computer facility, electric propulsion test craft, turbo-electric propulsion laboratory, acoustic measurement barge/acoustic data analysis center, Carr Inlet acoustic range facility, Santa Cruz acoustic range facility, ship electromagnetic signature reduction facility, superconducting materials for electric drive large scale vehicles, Santa Cruz radar imaging facility, surface effect ship test craft.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	1.329	1.303
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	0.848	1.039
TOTAL ANNUAL LAB	2.177	2.342
TOTAL INHOUSE	1.329	1.213
TOTAL INHOUSE RDT&E	1.329	1.213
ANNUAL OPERATING COST	0.489	0.485

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	22	6	9	13
CIVILIAN	15	3	6	9
TOTAL	37	9	15	22

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
1	21.264	6.001	9.318	36.583	0.000	1.746

MISSION

To conduct Research, Development, Tests and Evaluation in dental and allied sciences. Emphasis on problems of dental and oral health in Navy and Marine Corps populations and on problems of fleet and field dentistry.

CURRENT IMPORTANT PROGRAMS

Evaluation of new methods to prevent and treat dental emergencies in Naval personnel.
Development and evaluation of methods to prevent or intercept acute dental conditions.
Host responses to periodontopathic micro-organisms in Navy/Marine Corps personnel.
Development of an animal model to study periodontal disease.
Characterization of surface antigens of treponema denticola.

FUNCTIONS/EQUIPMENT/FACILITIES

Amino acid analyzer, atomic absorption unit, liquid scintillation counter, microcomputer, gas chromatograph unit, photo-microscope, animal surgery room, spectrophotometers, thermal balance, vivarium incubators, centrifuges, biological safety cabinet, fractionators, shakers, oscilloscope.

EXPLOSIVE ORDNANCE DISPOSAL TECH CENTER**INDIAN HEAD, MD****CO: CAPT J. T. KENNEDY****TECH DIRECTOR: E. RICE**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	59.847	58.258
TOTAL PROCUREMENT	4.819	4.142
TOTAL O&M	3.415	3.714
TOTAL OTHER	12.338	33.929
TOTAL ANNUAL LAB	80.419	100.043
TOTAL INHOUSE	30.559	38.016
TOTAL INHOUSE RDT&E	20.421	19.588
ANNUAL OPERATING COST	19.540	23.195

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	72	0	11	61
CIVILIAN	247	1	70	177
TOTAL	319	1	81	238

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
1,087	148.416	166.992	0.000	315.408	80.401	0.000

MISSION

To discharge the Navy's responsibility as single service manager for Explosive Ordnance Disposal (EOD) technology.

CURRENT IMPORTANT PROGRAMS

Joint service underwater.
 Jet perforator.
 Explosive detector.
 Rover/Recon magnetometer search system.
 Remote disrupter.
 All metals locator.

FUNCTIONS/EQUIPMENT/FACILITIES

Field joint service EOD tools and equipment. Support peacetime EOD needs of other government agencies. Develop and render safe procedures. Issue and maintain EOD publications. Respond to individual incidents, EOD/underwater equipment logistical functions. Special technology support as stated in MOU between OSD and Navy. Munitions disassembly, combined munitions disassembly, combined munitions countermeasures laboratory, nuclear incident response center.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	5.709	7.075
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	0.000	0.000
TOTAL ANNUAL LAB	5.709	7.075
TOTAL INHOUSE	4.405	5.380
TOTAL INHOUSE RDT&E	4.405	5.380
ANNUAL OPERATING COST	1.239	1.627

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	25	4	13	12
CIVILIAN	61	15	36	25
TOTAL	86	19	49	37

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
1	19.052	7.159	0.000	26.211	0.000	2.448

MISSION

To support fleet operational readiness through research, development, test, and evaluation of biomedical and psychological aspects of Navy and Marine Corps personnel health and performance.

CURRENT IMPORTANT PROGRAMS

Evaluation of health risks for Navy occupations. Chemical defense measures on sustained performance. Human performance effectiveness/physiological adaptation during sustained operations. Develop and test computerized operational medical information systems. Develop accurate non-battle injury data. Study performance degradation in cold.

FUNCTIONS/EQUIPMENT/FACILITIES

Electroenceph monitoring cardiovascular stress laboratory. Muscle strength testing laboratory. Computer storage: total Navy and Marine Corps health data, medical information systems VAX/VMS.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	25.970	30.129
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.105	0.075
TOTAL OTHER	0.036	0.625
TOTAL ANNUAL LAB	26.111	30.829
TOTAL INHOUSE	18.900	22.732
TOTAL INHOUSE RDT&E	18.759	22.165
ANNUAL OPERATING COST	6.724	7.345

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	251	49	93	158
CIVILIAN	205	34	119	86
TOTAL	456	83	212	244

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
7	115.684	36.664	45.259	197.607	7.063	14.784

MISSION

Conduct basic and applied research and development concerning the health, safety and efficiency of Navy and Marine Corps personnel.

CURRENT IMPORTANT PROGRAMS

Increase combat casualty care technology: wound healing, septic shock, tissue transplantation, transplantation immunology, microbiology, vaccine development, rapid diagnosis, epidemiology. Diving medicine (physiology, treatment, safety). Environmental stress (thermal, chemical, toxic). Bone marrow transplantation. Increase cell technology growth factor.

FUNCTIONS/EQUIPMENT/FACILITIES

Hyperbaric research facility with man-rated hyperbaric chambers. Heat and cold stress physiology (equipment and facilities). Human tissue preservation and storage (equipment and facilities). Biohazardous materials handling lab (equipment and facilities). Toxicology evaluation (equipment and facilities). Transmission and scanning electron microscopes. Fluorescent activated cell sorter and computers. Animal facilities and operating rooms. Lab equipment and facilities for basic and applied biochemical microbiological, psychological and immunological studies.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	3.717	2.635
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.194	0.210
TOTAL OTHER	0.097	0.387
TOTAL ANNUAL LAB	4.008	3.232
TOTAL INHOUSE	4.008	3.232
TOTAL INHOUSE RDT&E	3.717	2.635
ANNUAL OPERATING COST	1.715	1.400

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	16	2	8	8
CIVILIAN	101	2	41	60
TOTAL	117	4	49	68

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
1	16.892	10.990	4.148	32.030	0.500	2.900

MISSION

To conduct RDT&E in tropical medicine and infectious disease to enhance the health, safety and readiness of Navy and Marine Corp personnel in the performance of peacetime and contingency missions in Southeast Asia and other tropical and subtropical regions.

CURRENT IMPORTANT PROGRAMS

Develop and evaluate methods for rapid diagnosis of infectious disease.
 Test new ways to prevent, control and treat infectious diseases.
 Reduce disease threat by understanding and controlling insect vectors.
 Maintain technology-base for military relevant regional threat assessment.
 Assess rates of HIV infection in the Philippines and Indonesia.

FUNCTIONS/EQUIPMENT/FACILITIES

Mosquito breeding colony for parasite vector transmission and susceptibility studies with malaria and filariasis. Animal colony used for mosquito breeding, parasite studies and production of antigens and antibodies. Virology department has capability of culturing and identifying strains pathogenic to humans. Microbiology dept has sophisticated material and equipment required for detecting minute amounts of genetic material and biochemical interactions at the molecular level. Parasitology department has developed the first procedures for the growth of filariid worms in vitro. Tropical medical department uses a double laser flow identification of specific white cell types by detecting antigen antibody binding sites. All departments work closely with Indonesian medical officials and scientists.

CO: CAPT MICHAEL E. KILPATRICK

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	5.890	6.811
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.044	0.148
TOTAL OTHER	1.577	1.755
TOTAL ANNUAL LAB	7.511	8.714
TOTAL INHOUSE	5.934	6.959
TOTAL INHOUSE RDT&E	5.890	6.811
ANNUAL OPERATING COST	1.100	1.544

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	35	7	13	22
CIVILIAN	213	22	80	133
TOTAL	248	29	93	155

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
3	82.822	8.862	55.602	147.286	26.750	2.372

MISSION

To conduct RDT&E relating to the health, safety and readiness of Naval personnel assigned to Southwest Asia and Africa and to perform other such functions as may be directed by higher authority.

CURRENT IMPORTANT PROGRAMS

Epidemiology and prevalence of military-relevant infectious diseases in S.W. Asia and Africa. Rapid and early diagnosis of infectious diseases of military importance in S.W. Asia and Africa. Evaluation and development of schistosomal topical antitenetrant.

FUNCTIONS/EQUIPMENT/FACILITIES

A six-story biomedical research laboratory with one floor of P-3 containment capacity and five floors of well equipped P-2 laboratories. Capabilities in advanced techniques; serology, hybridoma technology and hybridization of DNA along with production of DNA probes, amino acid analysis, fluorescent microscopy and computer linked elisa reader, cytofluorograph, high pressure liquid chromatography, gas liquid chromatography, spectrophotometer, beta-scintillation counter, gama-counter, gamma cell 40, centri, ultracentrifuges and cryopreservation. Barrier breeding colony for research animals. Facilities for colony expansion and research animals.

NAVAL RESEARCH LABORATORY
WASHINGTON, DC
CDR: CAPT J.J. DONEGAN
DIR OF RSCH: DR. T. COFFEY

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	388.653	391.184
TOTAL PROCUREMENT	51.909	49.639
TOTAL O&M	21.907	23.900
TOTAL OTHER	188.237	177.674
TOTAL ANNUAL LAB	650.706	642.397
TOTAL INHOUSE	286.585	294.165
TOTAL INHOUSE RDT&E	194.765	198.592
ANNUAL OPERATING COST	85.110	96.634

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	116	4	30	86
CIVILIAN	3,479	768	2,393	1,086
TOTAL	3,595	772	2,423	1,172

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	2,799.564	196.463	438.769	3,434.796	165.600	151.700

MISSION

To conduct a broadly based multi-disciplinary program of scientific research and advanced technological development directed toward new and improved materials, equipment, techniques, systems, and related operational procedures for the Navy.

CURRENT IMPORTANT PROGRAMS

Advanced ECM and decoys for Navy EW systems.
Advanced acoustic and non-acoustic submarine detection programs.
Satellite programs.
Low observables technology.
Directed energy devices.

FUNCTIONS/EQUIPMENT/FACILITIES

Surveillance systems; component technology; materials; energy conversion; sensor systems; directed energy; environmental effects; biomolecular engineering; fire suppression/protection; low observable technology; basic physical sciences; fluid dynamics; countermeasures; communications navigation; undersea technology; sonar standards; space systems; artificial intelligence; science and technology; fiber optics systems; superconductivity. High level radiation laboratory, enclosed 11,500 cubic foot fire test facility, diverse high energy lasers, 200 kilogauss high field magnet facility, space simulation facilities, major plasma physics facilities. Electronic warfare central target simulator, class VI computer. Four Orion aircraft for research support. One ship for R&D on fire and personnel protection.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	368.794	337.845
TOTAL PROCUREMENT	106.902	99.729
TOTAL O&M	82.782	76.800
TOTAL OTHER	24.417	24.417
TOTAL ANNUAL LAB	582.895	538.791
TOTAL INHOUSE	365.163	360.497
TOTAL INHOUSE RDT&E	163.859	177.880
ANNUAL OPERATING COST	59.061	70.114

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	254	0	208	45
CIVILIAN	3,078	196	1,626	1,452
TOTAL	3,332	196	1,834	1,498

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
2,319	1,393.218	204.025	205.657	1,802.900	73.400	190.200

MISSION

To be the principal Navy Research, Development, Test and Evaluation center for Command, Control, Communications, ocean surveillance, surface and air-launched undersea weapons systems and submarine arctic warfare.

CURRENT IMPORTANT PROGRAMS

Command, Control and Communication (C3) systems, multi-platform combat systems integration. Surface ship communication systems, ocean surveillance; Integrated ASW including surface and air-launched underwater weapons and surface ship ASW control systems. Submarine arctic warfare. Warfare analysis for C3, ocean surveillance, and ASW architecture. Ocean sciences and engineering, marine biosciences, C3CM and signals.

FUNCTIONS/EQUIPMENT/FACILITIES

Arctic research facility, C3 site. Tactical Flag Command Center (TFCC). Flag Data Display System (FDDS). Research, Evaluation and Systems Analysis facility (RESTA). Maritime Defense Zone (MARDEZ Development and Integration Facility). Standard Embedded Computer Resources (SECR) lab. Distributed C2 system architecture processing test bed. Combat Direction Systems Development and Evaluation Site (CDES). Over-the-horizon targeting reconfigurable land-based test site. JTIDS System Integration Facility (SIF). Intelligence Systems Laboratory. Surveillance Test and Integration Center (STIC). Countermeasures Assessment Simulator (CMAS). Navy Front End Processor facility (NFLP). Navy UHF communication Test Facility (NUSTF). Shore Cryptology Support Systems test bed (SCSS). Communication and aerospace communication laboratory including VLF/LF test bed. Tactical Surveillance Laboratory (TSL). Image/signal process facility. EHF satcom terminal test bed. Ship antenna model range. Undersea weapons lab.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	61.607	62.967
TOTAL PROCUREMENT	1.837	36.781
TOTAL O&M	3.747	6.583
TOTAL OTHER	0.369	1.541
TOTAL ANNUAL LAB	67.560	107.872
TOTAL INHOUSE	55.283	54.744
TOTAL INHOUSE RDT&E	35.256	35.118
ANNUAL OPERATING COST	7.107	7.851

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PRCF	NON- PROF
MILITARY	24	1	15	9
CIVILIAN	487	95	371	116
TOTAL	511	96	386	125

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	127.963	28.268	65.096	221.327	14.456	59.570

MISSION

To be the principle Navy corporate laboratory performing integrated RDT&E in ocean science, ocean acoustics, atmospheric science and related technologies to improve and support Navy systems and operations.

CURRENT IMPORTANT PROGRAMS

Low frequency acoustic reverberation. Advanced underwater acoustic modeling. Develop computer models which analyze/assimilate atmospheric data. Predict atmospheric effect on Navy systems. Air defense initiative (environmental support). Ocean geophysics basic research. Ocean sciences basic research.

FUNCTIONS/EQUIPMENT/FACILITIES

Secure and unclassified acoustic data processing, array design test fabrication, microprocessor design and development, acoustic data bases, ocean acoustics mobile underwater test bed, environmental acoustics lab, mass spectrometer, gas chromatograph systems, towed underwater pumping systems, DTAGS, VEDABS, ADABS, acoustic sediment classifier, sediment characteristics, probes, side scan sonar systems, wave current simulator, scanning and transmission electron microscopes with image analysis system and X-Ray spectrometer, ocean bottom seismometers, geotech lab, X-ray fluorescent facility, pattern analysis lab (Tempest certified), magnetic observatory, optics lab, hydrographic airborne laser systems and AEM systems, shallow water acoustic platform capable of receiving, enhancing and analyzing remotely sensed atmospheric data.

CO: CAPT D.G. MAXWELL

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	9.783	8.922
TOTAL PROCUREMENT	2.797	4.258
TOTAL O&M	1.474	1.588
TOTAL OTHER	0.915	1.099
TOTAL ANNUAL LAB	14.969	15.867
TOTAL INHOUSE	4.265	4.509
TOTAL INHOUSE RDT&E	1.716	1.738
ANNUAL OPERATING COST	1.853	2.011

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	79	0	24	55
CIVILIAN	78	0	21	57
TOTAL	157	0	45	112

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
95	114.086	50.916	34.795	199.797	6.775	8.111

MISSION

Provide quality and responsive technology and material support to the fleet for land based flight test and evaluation. Operate the DOD missile test range at White Sands as assigned by commander, Naval Sea Systems Command.

CURRENT IMPORTANT PROGRAMS

Standard missile 1 and 2, AEGIS flight testing.
Cruise missile flight testing.
RAM flight testing.
16 inch gun program (remote land based test site).
Upper atmosphere research rocket launching.

FUNCTIONS/EQUIPMENT/FACILITIES

Flight test Terrier/Tartar/Standard/SAM guided missiles and projectiles. Launch various sounding rockets for upper atmospheric study and in support of SDI. Conduct various development tests for SSM and SAM projects, rolling drone support and Vandal missile high speed targets. Five inch guided projectile firing capability. Provide warhead and EOD analysis arena. MK 41 VLS launch supporting SM, VLA, Tomahawk, 16 inch gun ammunition improvement program with new remote land based test site. Sealane land based test site. NATO Seasparrow land based test site. Support/conduct all high energy laser tests at White Sands missile range with Miracle Laser Sealite Beam Director. Sponsor NAVAIR launch missiles, bomb, and other weapons system test. Provide sounding rocket launch support for commercial launch companies.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	236.711	214.105
TOTAL PROCUREMENT	261.211	244.432
TOTAL O&M	162.627	212.318
TOTAL OTHER	48.955	92.976
TOTAL ANNUAL LAB	709.504	763.831
TOTAL INHOUSE	496.653	534.895
TOTAL INHOUSE RDT&E	165.698	149.874
ANNUAL OPERATING COST	198.896	194.437

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	1,103	0	415	688
CIVILIAN	4,332	14	1,380	2,952
TOTAL	5,435	14	1,795	3,640

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
27,093	1,387.261	485.121	3,502.588	5,374.970	224.922	555.482

MISSION

Perform development, test and evaluation development support, production support follow-on engineering logistics and training support for Naval weapons systems, electronic warfare systems, target systems, and related equipment devices. Provide major range, technical and base support for fleet users and other DOD and government agencies.

CURRENT IMPORTANT PROGRAMS

Air and surface launched cruise missiles and strategic systems development. Support, T&E, and ISE on air launched guided weapons and conventional ordnance. EW systems readiness and mission performance. EWSSA, support equipment development. Targets development and life cycle targets management. Range systems development. Fleet readiness support. Mobile sea range.

FUNCTIONS/EQUIPMENT/FACILITIES

Laboratories for airborne weapons systems integration, test, and evaluation including software support and electronic warfare systems. Laboratories include hardware-in-the-loop simulation, environmental test/reliability growth, anechoic measurements, and all up round test. A 35,000 square mile sea test range provides for flight test of aircraft and missile systems. Range instrumentation includes: C-band radars; land S-band telemetry; data transmission, display, and reduction; air and sea targets with various augmentation; command control/flight termination; launch and recovery; and communications. A 1000 square mile underwater range at Barking Sands, Hawaii provides fleet training support in air, surface, and anti-submarine warfare.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	18.381	17.983
TOTAL PROCUREMENT	0.467	0.275
TOTAL O&M	9.224	11.469
TOTAL OTHER	0.975	0.476
TOTAL ANNUAL LAB	29.047	30.203
TOTAL INHOUSE	17.791	18.656
TOTAL INHOUSE RDT&E	11.195	11.756
ANNUAL OPERATING COST	5.939	5.203

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	25	0	15	10
CIVILIAN	277	71	221	56
TOTAL	302	71	236	66

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
3	73.320	18.417	0.000	91.737	1.900	12.899

MISSION

To conduct R&D to improve performance of individuals, teams, and organizations within the Navy and Marine Corps. To provide products and services specifically directed at improving Department of Navy personnel planning, testing, acquisition, selection, classification, training, utilization, motivation organization, management and other contemporary issues.

CURRENT IMPORTANT PROGRAMS

Manpower management.
Education and training.
Personnel administration.
Organizational systems.

FUNCTIONS/EQUIPMENT/FACILITIES

An IBM 4381/23 and three Unix minicomputer systems provide general purpose ADPE services, electronic mail and access to the Defense Data Network (DDN) for center research and administrative operations. System supplemented by a large inventory of microcomputers supporting specific research projects. Neurosciences laboratory including unique data acquisition and analysis equipment and instrumentation for neuromagnetic data collection and analysis.

SUBMARINE MEDICAL RESEARCH LABORATORY**GROTON, CT****CO: CAPT R.G. WALTER****CHIEF SCIENTIST: CAPT P.K. WEATHERSBY**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	4.513	2.927
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	0.000	0.000
TOTAL ANNUAL LAB	4.513	2.927
TOTAL INHOUSE	3.474	2.224
TOTAL INHOUSE RDT&E	3.474	2.224
ANNUAL OPERATING COST	1.800	1.800

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	31	6	11	20
CIVILIAN	43	10	26	17
TOTAL	74	16	37	37

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
1	40.514	14.099	0.000	54.613	0.000	2.380

MISSION

To conduct medical research and development as it relates to submarine shipboard, diving and amphibious environments.

CURRENT IMPORTANT PROGRAMS

Computer-based medical diagnosis for use aboard submarines.
 Medical problems associated with pressurized submarine rescue.
 Reduction of attrition rates for submariners by better screening.
 Improved performance on auditory sonars and visual sonar displays.
 Physiological and performance effects of altered submarine atmosphere.

FUNCTIONS/EQUIPMENT/FACILITIES

Laboratory facilities for use of up-to-date equipment and instruments to do basic and applied research. Facilities include: two-man rated 300 and 150 PSIG hyperbaric chambers, complete exercise physiology laboratory instrumentation ship, computer applications center, technical library, graphic arts and photography shop, animal sciences facility, anechoic chambers, psychoacoustic laboratory, operational sonar simulation laboratories, cell culture lab, mass spectrometers, gas chromatographs.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	343.498	337.333
TOTAL PROCUREMENT	221.116	223.921
TOTAL O&M	126.123	136.368
TOTAL OTHER	39.944	26.288
TOTAL ANNUAL LAB	720.681	723.916
TOTAL INHOUSE	357.451	395.969
TOTAL INHOUSE RDT&E	186.232	200.756
ANNUAL OPERATING COST	84.839	99.119

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	106	0	40	66
CIVILIAN	5,098	229	2,687	2,411
TOTAL	5,204	229	2,727	2,477

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
5,084	1,595.169	316.958	1,345.213	3,257.340	157.000	378.330

MISSION

To be the principal Navy Research, Development, Test and Evaluation center for surface ship combat systems, ordnance, mines and strategic systems support.

CURRENT IMPORTANT PROGRAMS

Strategic systems-Trident, SLBM targeting, combat systems-AEGIS, chemical and biological defense, Tomahawk weapon systems-gun, SM-2, VLS, guns ammunition underwater systems-mines, torpedo warheads, ASW systems electronic systems-FW systems, electro-magnetic effects, AEGIS radar, search and track, protection systems-magnetic silencing.

FUNCTIONS/EQUIPMENT/FACILITIES

Wind tunnels complex with capability up to mach 18. 25 mile river range for testing guns and ammunition and integrated shipboard sensors. Disk pack facility for SLBM fire control systems and targeting. Product assurance and simulation facilities for surface ship combat systems. AEGIS computer facility. Ocean and harbor ranges, 1.75 million gallon hydro-ballistics tank. Mine tank and sensor facility for testing mines and underwater systems, explosives and warheads complexes. Materials research facility. Major computer and software development facility. CB defense laboratory. Nuclear effects facility, general purpose laboratories, compartmented laboratory.

CO: CAPT H.P. SALMON, JR

TECH DIRECTOR: MR. EARL MESSERE

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	312.860	313.545
TOTAL PROCUREMENT	209.638	203.708
TOTAL O&M	110.753	92.221
TOTAL OTHER	29.080	23.008
TOTAL ANNUAL LAB	662.331	632.482
TOTAL INHOUSE	324.066	290.942
TOTAL INHOUSE RDT&E	158.823	151.290
ANNUAL OPERATING COST	79.151	85.900

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	88	1	83	5
CIVILIAN	3,569	103	2,174	1,395
TOTAL	3,657	104	2,257	1,400

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
965	1,416.416	331.660	872.527	2,620.603	146.217	139.107

MISSION

To be the principal Navy RDT&E center for submarine warfare, submarine weapon systems and surface ship sonar systems.

CURRENT IMPORTANT PROGRAMS

AN/BSY-1 and -2 submarine combat systems, AN/SQQ-5 SSN sonar system, wide aperture array, towed array sonar system, combat control system, MK 1 and 2, submarine periscopes, MK 48 advanced capability torpedo, submarine-launched Tomahawk cruise missile, SSN-21 launchers, submarine turbine pump ejection system, MMK 17 and 18, AN/SSQ-89 ASW combat system, new attack submarine.

FUNCTIONS/EQUIPMENT/FACILITIES

Primary RDT&E capability for Navy submarine combat control systems, submarine integrated combat systems, submarine sonar, submarine electromagnetic systems, surface anti-submarine warfare systems, submarine torpedo systems, submarine missile systems, launcher systems, advanced underwater vehicles, undersea ranges development and operation, and warfare analysis. Acoustic display research facility, acoustic test tank facility, advanced submarine launcher facility, advanced towed array facility, advanced underwater vehicle quiet propulsion R&D facility, Atlantic Undersea T&E center, combat systems technology laboratory, hybrid micro-circuit design and fabrication facility, integrated transducer design facility, integrated warfare analysis laboratory, land-based integration test sites, man-machine sonar test bed, missile simulation, development and test facility, periscope R&D test facility, quiet water tunnel experiment facility, submarine antenna over-water architecture facility, superconducting electromagnetic thruster.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	424.936	387.898
TOTAL PROCUREMENT	266.514	226.572
TOTAL O&M	54.734	62.664
TOTAL OTHER	56.672	70.391
TOTAL ANNUAL LAB	802.856	747.525
TOTAL INHOUSE	408.281	380.143
TOTAL INHOUSE RDT&E	247.565	225.987
ANNUAL OPERATING COST	118.992	137.365

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	491	0	23	468
CIVILIAN	5,275	167	2,112	3,163
TOTAL	5,766	167	2,135	3,631

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
1,123,135	2,468.842	315.364	2,763.296	5,547.502	328.014	167.161

MISSION

To be the principal Navy RDT&E center for air warfare systems (except anti-submarine warfare systems) and missile weapon systems.

CURRENT IMPORTANT PROGRAMS

Anti-air missiles: Sidewinder, Standard Missile, Sparrow, RAM, Phoenix.

Anti-surface weapons: Harm, Sidarm, Tomahawk, Skipper, Slam, AIWS, ABF.

Electronic warfare: ALR-67, LCS, Erase, Echo Range, tactics.

Tactical aircraft systems: A-6, A-7, AV-8, F/A-18, AH-1.

Technology base: sensors, propulsion, warhead, guidance, fuzing, materials.

FUNCTIONS/EQUIPMENT/FACILITIES

Conduct research, establish and maintain primary RDT&E support for Navy, Marine Corps, and joint-service products such as anti-air missiles, anti-surface weapons, defense-penetration systems, and integrated tactical aircraft systems. Facilities include Michelson Laboratory, Lauritsen Laboratory, EW threat environment simulation facility (echo range), solid-state laboratory, encounter simulation laboratory, propulsion research laboratory, microelectronics facility, explosives R&D facility, ground and air ranges, military targets range, armitage field, parachute test facilities, supersonic test tracks, microwave anechoic facilities, RF and IR/E-O hardware-in-the-loop simulations, laser/optics/E-O laboratories, weapons and tactics analysis center, aircraft weapons survival laboratory, aircraft integration/simulation facilities, strategic systems T&E facility, and radar cross-section facility.

WEAPONS EVALUATION FACILITY**ALBUQUERQUE, NM****CO: CAPT R.K. HULL****TECH DIRECTOR: SCOTT R. RANDALL**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	5.359	4.728
TOTAL PROCUREMENT	1.003	1.200
TOTAL O&M	4.157	3.000
TOTAL OTHER	0.320	0.350
TOTAL ANNUAL LAB	10.839	9.278
TOTAL INHOUSE	9.361	7.979
TOTAL INHOUSE RDT&E	4.918	4.175
ANNUAL OPERATING COST	3.793	2.500

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	105	0	11	94
CIVILIAN	136	0	37	99
TOTAL	241	0	48	193

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
7	23.000	34.000	99.000	156.000	0.970	2.913

MISSION

To conduct the Navy Nuclear Weapons System Safety Program. To conduct test and evaluation projects on nuclear and selected non-nuclear weapons. To perform nuclear certification trials including nuclear insurv.

CURRENT IMPORTANT PROGRAMS

Ongoing nuclear safety program on all Navy nuclear weapons systems.
Development support for such programs as F/A-18A, the Trident D5.
Maintenance of over 500 loading manuals and checklists.
SSN-21 submarine.

FUNCTIONS/EQUIPMENT/FACILITIES

Conduct Navy Nuclear Weapon System Safety Program. Conduct certification and compatibility trials on air-launched nuclear weapon systems. Support the design, development, test, and evaluation of new nuclear weapon systems. Support Navy nuclear survivability programs. Develop, verify and maintain conventional and nuclear weapon loading manuals and checklists for all Navy aircraft. Capabilities: flight test utilizing 2 A-7 and 2 F/A-18 aircraft, extensive aircraft instrumentation, telemetry and data reduction. In-house computer facilities and access to extensive Kirkland Air Force Base computer resources, access to White Sands Missile Range and the Sandia and Los Alamos National Laboratories, access to HPD and VPD EMP test facilities.

DEPARTMENT OF THE AIR FORCE

AERO PROPULSION AND POWER LABORATORY**WPAFB, OH****CDR: DONALD J. CAMPBELL****CH SCI DIR: DR. EDWARD D. CURRAN**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	171.274	171.203
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	1.980	1.828
TOTAL ANNUAL LAB	173.254	173.031
TOTAL INHOUSE	25.511	27.051
TOTAL INHOUSE RDT&E	23.531	25.223
ANNUAL OPERATING COST	1.045	1.050

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	45	4	40	5
CIVILIAN	318	30	229	89
TOTAL	363	34	269	94

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
41	283.893	20.770	349.510	654.173	311.033	30.000

MISSION

Plan and execute research, exploratory and advanced development programs in air breathing propulsion, aerospace power and fuels and lubrication. Conduct contract and in-house programs. Provide operational and systems support.

CURRENT IMPORTANT PROGRAMS

Integrated high performance turbine engine technology.
 High mach number propulsion system technology.
 Power technology for military aircraft.
 Propulsion technology for air-launched missile.
 More-electric aircraft technology.

FUNCTIONS/EQUIPMENT/FACILITIES

Compressor test facility, Compressor Research Facility (CRF), CRF structures laboratory, CRF component test lab, Turbine Research Lab (TRL), turbine flat plate test facility, Advanced Turbine Aero-thermal Research (ATAkS), analytical support for TRL, control systems research facilities, ramjet engine test facilities, ramjet combustion research facility, ramjet combustor flow visualization facility, fuels and lubrication lab, fuel development facilities, lubrication research facilities, combustion research facilities, SPA level engine test stand fuel and lubricant storage facilities, research air facility, propeller test facility, helicopter rotor test facility, high power lab, electrical lab, battery lab, photovoltaic research lab, thermal lab, high speed drive stand/fluid power lab, superconductivity research lab, plasma physics lab.

CDR: COL. IRVING J. LEBLANC

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	36.516	43.076
TOTAL PROCUREMENT	0.000	0.416
TOTAL O&M	4.241	1.466
TOTAL OTHER	0.655	1.627
TOTAL ANNUAL LAB	41.412	46.585
TOTAL INHOUSE	8.662	11.581
TOTAL INHOUSE RDT&E	8.659	10.596
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	110	15	42	68
CIVILIAN	164	31	98	66
TOTAL	274	46	140	134

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
28	183.056	103.523	77.847	364.426	27.795	30.388

MISSION

Accomplish behavioral and biomedical research and development to define human tolerance and degradation of human performance under the condition of environmental stress associated with aerospace operations and provide support to system development in the above areas.

CURRENT IMPORTANT PROGRAMS

Operator command control and communications technology. Crew systems automation technology. Advanced escape technology, human countermeasures technology. Environmental health protection technology. Man-in-space alternatives technology. Chemical defense technology.

FUNCTIONS/EQUIPMENT/FACILITIES

Human deceleration system to simulate the complex acceleration environment associated with ejection and crash landing. Dynamic environment simulator, a six degree of freedom man-rated centrifuge used to simulate sustained accelerations such as those encountered in air combat maneuvering. Thomas domes: eight altitude exposure chambers to simulate exotic artificial ties used to perform real-time man-in-the-loop experiments. Anechoic and reverberation chambers to enable experimental investigations of potentially hazardous noise to determine effects on body functions and performance. Vivarium-laboratory research animal facility.

AIR FORCE DEVELOPMENT TEST CENTER**EGLIN AFB, FL****CDR: COL THOMAS B. LINDAHL****CHIEF SCIENTIST: DR. TERRY R. LITTLE**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	151.769	176.702
TOTAL PROCUREMENT	1.416	1.972
TOTAL O&M	70.855	45.418
TOTAL OTHER	173.004	11.541
TOTAL ANNUAL LAB	397.044	235.633
TOTAL INHOUSE	336.554	160.904
TOTAL INHOUSE RDT&E	97.132	108.456
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	9,969	13	1,776	8,193
CIVILIAN	906	2	255	651
TOTAL	10,875	15	2,031	8,844

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)			COST (MILLIONS \$)		
	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.	
455,204	89.852	654.157	9,453.400	10,197.409	432.212	500.884

MISSION

ASD is the Air Force's lead organization for munitions development planning. Mission is to foster innovation through long-range planning and weapons concepts, to determine preferred configuration and systems approaches and to direct technology development. Manages Strategic Defense Initiative (SDI) Research program.

CURRENT IMPORTANT PROGRAMS

Development planning.
Small business innovative planning.
Foreign weapon evaluation.
Nato cooperative list.

FUNCTIONS/EQUIPMENT/FACILITIES

Scientific and Engineering personnel and laboratory facilities capable of exploratory, advanced, and engineering development of non-nuclear munitions and equipment. Armament systems test environment covering 725 square miles with large adjacent water areas. Facilities include: 28 test areas with instrumented facilities including precision tracking radars and photo-optics used for munitions testing and electromagnetic testing environment; instrumented complex of threat systems for evaluating weapons systems effectiveness; a realistic environment for testing a weapon system against an active defense system; a climatic laboratory capable of testing complete weapon systems; a computer science lab; a physical lab; a photo lab; an instrument R&D facility; and a missile simulation and test laboratory.

ARMAMENT LABORATORY**EGLIN AFB, FL****CDR: COL JOHN PLETECHER****CHIEF SCIENTIST: DR. SAMUEL C. LAMBERT**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	130.677	150.367
TOTAL PROCUREMENT	0.106	1.405
TOTAL O&M	0.010	0.019
TOTAL OTHER	0.000	0.000
TOTAL ANNUAL LAB	130.793	151.791
TOTAL INHOUSE	35.396	56.330
TOTAL INHOUSE RDT&E	35.280	56.228
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL FHDS	TOTAL PROF	NON- PROF
MILITARY	107	3	80	27
CIVILIAN	394	15	263	131
TOTAL	501	18	343	158

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
500	178.500	160.200	25.000	363.700	61.500	54.147

MISSION

Armament laboratory develops conventional armament technology and integrates technologies into weapon airframes. Conventional armament technology thrusts include advanced guidance, weapon flight mechanics, ordnance and strategic defense.

CURRENT IMPORTANT PROGRAMS

Autonomous synthetic aperture radar guidance technology.

Hard target ordnance technology.

Strategic Defense Initiative (SDI) kinetic energy weapons and lethality.

Advanced tactical radar seeker.

Programmable ordnance technology.

FUNCTIONS/EQUIPMENT/FACILITIES

Major equipment consists of a variety of analyzers, guidance hardware-in-the-loop simulated radar systems, explosive mixer equipment, and measurement machines, including RF, X-Ray and laser capabilities. Facilities include 20 separate laboratories/facilities for the conduct of a wide range of experiments, radar signal processing laboratory, RF/MMW laboratory, optic laboratory, image processing laboratory, research and design laboratory, interior ballistics, laboratory, high explosive research and development facility, advanced warheads experimentation facility, aeroballistics research facility, ballistics experimentation facility, carriage and release test facility, hypervelocity launcher experimentation facility, chemistry laboratory, microanalysis laboratory, a rapid response model fabrication shop, and a technical library with rapid access to several data banks.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	231.168	231.168
TOTAL PROCUREMENT	8.048	8.048
TOTAL O&M	1.955	1.955
TOTAL OTHER	53.207	53.207
TOTAL ANNUAL LAB	294.378	294.378
TOTAL INHOUSE	211.400	211.400
TOTAL INHOUSE RDT&E	161.818	161.818
ANNUAL OPERATING COST	64.365	64.365

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	147	1	80	67
CIVILIAN	270	7	93	177
TOTAL	417	8	173	244

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	AD'N	OTHER	TOTAL	REAL PROP.	EQUIP.
39,181	1,035.000	211.703	1,274.770	2,526.473	1,027.138	158.282

MISSION

Test aircraft, missile, and space system and subsystems at the flight conditions they will experience during a mission. AEDC conducts a research and technology program to develop advanced testing techniques and instrumentation, and to support the development of new test facilities.

CURRENT IMPORTANT PROGRAMS

Peacekeeper testing includes aerodynamic and rocket motor firings.
Strategic Defense Initiative (SDI) testing.
Small ICBM motor development and aerodynamic testing.
Advanced tactical fighter propulsion and flight dynamics testing.
Inertial upper stage rocket motor firings.

FUNCTIONS/EQUIPMENT/FACILITIES

Included are wind tunnels with sections to 16ft and speeds from subsonic to mach 20; turbine engine test cells which provide simulation to mach 3; rocket test cells, the largest rated at .5 million lbs thrust at altitude; space chambers to 42ft diameter and 82ft high; hyperballistic ranges; dust and snow erosion facility; bird impact facility; and two captive trajectory systems. These facilities have supported development and qualification of most major aeronautical, missile, and space systems since 1954. This testing complements expensive and often hazardous flight testing, and assures that system deficiencies are found early, saving time and resources in the overall development, acquisition, and deployment process.

ASTRONAUTICS LABORATORY**EDWARDS AFB, CA****DIR: DR. RICHARD R. WEISS****DEPUTY DIR: COL MICHAEL HAVEY**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	132.000	119.000
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	0.000	0.000
TOTAL ANNUAL LAB	132.000	119.000
TOTAL INHOUSE	40.127	34.146
TOTAL INHOUSE RDT&E	40.127	34.146
ANNUAL OPERATING COST	1.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	137	4	65	72
CIVILIAN	294	24	168	126
TOTAL	431	28	233	198

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
683,450	507.018	166.980	7.150	681.148	179.343	41.752

MISSION

Conduct the Air Force's rocket propulsion and interdisciplinary space technology research, exploratory and advanced technology development programs for future ICBMs, air launched missiles, space vehicles and satellites. Provide rocket propulsion technological support to DOD and non-DOD agencies.

CURRENT IMPORTANT PROGRAMS

Provide solid propulsion options for advanced ballistic missile systems. Provide low signature, high performance, and lightweight propulsion options for tactical missiles. Provide low cost high performance propulsion options for launch vehicles. Provide high performance propulsion options for space systems orbit transfer. Demonstrate higher performance non-conventional propulsion concepts.

FUNCTIONS/EQUIPMENT/FACILITIES

Laboratories for synthesis, analysis, formation and evaluation of new propellants. Facilities for mixing, casting, curing and testing solid rocket motors and components. Solid motor experimental complex for investigation of combustion, aging, structural integrity, ballistic performance and high temp components. Laboratory for experimentation of small altitude control and satellite propulsion systems and components in simulated space environments. Altitude experimentation of liquid, solar, electric and solid rockets up to 50,000 pounds thrust. Ambient experimentation of liquid or solid rockets up to 10,000,000 pounds thrust. In-house analytical capability for design, analysis and data reduction. Shops for fabricating experimental hardware systems. Carbon-carbon and filament winding laboratory. High energy density matter laboratory. Space structure dynamics laboratory.

DIR: MR. MARVIN SPECTOR

CH SCI DIR: DR. JESSE C. RYLES

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	192.694	195.709
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	4.325	4.854
TOTAL ANNUAL LAB	197.019	200.563
TOTAL INHOUSE	27.897	28.579
TOTAL INHOUSE RDT&E	23.572	23.725
ANNUAL OPERATING COST	1.672	1.700

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	88	0	77	11
CIVILIAN	400	17	321	79
TOTAL	488	17	398	90

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
198	152.026	12.536	405.334	569.896	65.904	32.000

MISSION

Maintains an avionics technology base through research exploration and advanced development and assigned basic research programs. Develop and demonstrate cost-effective avionics concepts to reduce acquisition and operating costs and improve operational capabilities.

CURRENT IMPORTANT PROGRAMS

Silent Attack Warning System (SAWS).
Automatic Radar Target Identification (ARTI).
Air-to-air attack management.
Airborne Imagery Transmission (ABIT).

FUNCTIONS/EQUIPMENT/FACILITIES

Technical areas include navigation, surveillance, reconnaissance, electronic warfare, fire control, weapon delivery, communications, system architecture, information and signal processing, subsystem integration supporting electronics, and software research, development and application. In-house laboratories include simulation and analysis of integrated digital systems, design and performance evaluation of electro-optical systems and correlation with weather observation, simulation of real-world signal jamming environment for evaluation of electronic warfare systems, evaluation of reconnaissance sensors in realistic flight environment. Other laboratories are maintained for evaluation of airborne and space sensors and components from optical to radio frequencies.

ELECTRONIC TECHNOLOGY LABORATORY

WPAFB, OH

DIR: WILLIAM J. EDWARDS

CH SCI DIR: DR. EDWIN B. CHAMPAGNE

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	43.419	49.974
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	0.837	0.771
TOTAL ANNUAL LAB	44.256	50.745
TOTAL INHOUSE	7.759	7.425
TOTAL INHOUSE RDT&E	6.922	6.654
ANNUAL OPERATING COST	0.418	0.420

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	19	2	17	2
CIVILIAN	124	3	93	31
TOTAL	143	15	110	33

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
2	85.987	2.179	45.550	133.716	21.968	10.000

MISSION

Conducts in-house and contractual research and exploratory and advanced development programs to satisfy technology needs for Air Force electronic components and devices.

CURRENT IMPORTANT PROGRAMS

Microwave/millimeterwave monolithic integrated circuits.
 Microelectronics manufacturing science and technology.
 Basic hardware descriptive language.
 Electro-optics sources and detectors.
 Packaging and interconnect technology.

FUNCTIONS/EQUIPMENT/FACILITIES

Areas of interest range from basic research to manufacturing, emphasizing solid state electronic device research. In-house R&D capabilities include computer aided electronic design and modeling, epitaxial growth of compound semiconductors, electronic and optical characterization of semiconductor structures, fabrication of advanced electronic and electro-optical semiconductor devices, electronic testing of devices and components from direct current to millimeter wave frequencies. Optical testing of both lasers and detectors from the far infrared to the ultra-violet, and spectroscopy of laser materials.

ENGINEERING AND SERVICES LABORATORY**TYNDALL AFB, FL****CDR: COL NAY****DIRECTOR: COL HANES**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	15.964	16.274
TOTAL PROCUREMENT	20.251	24.118
TOTAL O&M	4.287	4.924
TOTAL OTHER	0.000	0.000
TOTAL ANNUAL LAB	40.502	45.316
TOTAL INHOUSE	8.630	8.618
TOTAL INHOUSE RDT&E	3.397	3.000
ANNUAL OPERATING COST	0.215	0.284

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	39	6	40	0
CIVILIAN	44	8	36	8
TOTAL	83	14	76	8

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	49.787	1.860	57.186	108.833	4.647	10.780

MISSION

Engineering and Services Laboratory is the lead agency for research, development, test and evaluation in the areas of civil and environmental engineering. In addition, the laboratory has been designed as the focal point for environmental quality and lead laboratory for facilities energy.

CURRENT IMPORTANT PROGRAMS

Candidate training agent to replace Halon 1211.

Spray casting.

Air Force protective construction design manuals.

Gyratroy asphalt design for high pressure tires.

Metals recovery.

FUNCTIONS/EQUIPMENT/FACILITIES

Facilities: environmental quality laboratory - exploratory development of new concepts to eliminate or substantially reduce environmental consequences of future Air Force weapon systems; airfield soils and surfaces evaluation track - tests chemical effects on runway surfaces; bomb crater test facilities - evaluate different bomb crater filling techniques; structures explosive test site - evaluate and improve NATO building criteria; fire test facility - improve fire detection/suppression for hardened aircraft shelters; and engineering services laboratory - conduct civil engineering research. Equipment: centrifuge for subscale testing, mass spectrometer for pollutant analysis; and load cart for testing aircraft landing effects on runway pavements.

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	161.575	165.140
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.051	0.035
TOTAL OTHER	8.027	7.534
TOTAL ANNUAL LAB	169.653	172.709
TOTAL INHOUSE	47.986	45.164
TOTAL INHOUSE RDT&E	39.908	37.595
ANNUAL OPERATING COST	1.683	1.680

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL FHDS	TOTAL PROF	NON- PROF
MILITARY	113	4	87	26
CIVILIAN	543	33	390	153
TOTAL	656	37	477	179

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
75	368.868	204.174	94.319	667.361	47.152	38.000

MISSION

Plans, formulates, and executes technology programs for aerospace flight vehicles in structures, aerodynamics, flight control, and vehicle subsystems/equipment.

CURRENT IMPORTANT PROGRAMS

Advanced fighter technology integration (F-16).
 Forward swept wing technology demonstrator (X-29).
 Short Takeoff and Landing (STOL) technology demonstrator.
 Advanced composites and metallic structures.
 Computational fluid dynamics.

FUNCTIONS/EQUIPMENT/FACILITIES

Programs cover basic research and exploratory, advanced and engineering development, as well as technology integration. The subsonic aerodynamic research laboratory is an open-circuit wind tunnel with a maximum test section velocity of Mach 0.6. The full-scale static, thermal and fatigue test laboratory can conduct single or combined tests on several aircraft simultaneously. The landing gear test facility has dynamometers and other special equipment for testing tires, brakes, and landing gear struts. The flight control development laboratory can evaluate advanced control concepts in a mission environment using simulators and other laboratories for crew system design and actuation system test. The transonic gas dynamic facility can operate at subsonic, transonic, and supersonic speeds. The vertical wind tunnel can perform spin tests and also evaluate the dynamic behavior of parachutes.

FLIGHT TEST CENTER**EDWARDS AFB, CA****CDR: BGEN ROY D. BRIDGES, JR.****TECH DIR: RICHARD R. HILDEBRAND**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	276.408	289.109
TOTAL PROCUREMENT	9.661	8.659
TOTAL O&M	45.622	50.424
TOTAL OTHER	153.008	161.329
TOTAL ANNUAL LAB	484.699	509.521
TOTAL INHOUSE	306.128	327.250
TOTAL INHOUSE RDT&E	141.807	161.546
ANNUAL OPERATING COST	131.715	124.247

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	3,723	48	2,090	1,633
CIVILIAN	2,615	21	626	1,989
TOTAL	6,338	69	2,716	3,622

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
297,438	234.851	293.008	8,238.689	8,766.548	510.232	232.370

MISSION

The mission of the flight test center is for aerodynamic testing of manned and unmanned aerospace vehicles as well as aircraft subsystems. The AFFTC operates the U.S. Air Force test pilot school, Edwards range and the Utah test and training range.

CURRENT IMPORTANT PROGRAMS

Strategic bombers: B-1B DT&E/IOT&E, B-2 DT&E/IOT&E.
 Tactical system upgrades: F-15E, F-16 BLK 40/Lantern, YA-7F and F-111 DFCS.
 Strategic systems upgrades: advanced cruise missile, Tacit Rainbow.
 Cargo aircraft: C-17 DT&E/IOT&E, AC-130 gunship, MC-130 Combat Talon II.
 Technology: Space Shuttle, X-29, AFTI F-16, AFTI F-111

FUNCTIONS/EQUIPMENT/FACILITIES

Some of the major unique facilities and equipment include the integration facility for avionics system test (IFAST), Benefield anechoic facility, real time mission control facility, precision impact range area used for bombing/gunnery/infrared systems integration testing, personnel and cargo parachute drop zones, hydrant refuelling system for heavy aircraft, aircraft weight and balance facility, largest aircraft landing area in the free world, integrated missile maintenance facility complex, R-2508 restricted airspace, photo/video laboratory for airborne and ground testing, intermediate aircraft maintenance support capability, Pacer Comet jet engine test facility, horizontal aircraft thrust stand, photo resolution range, instrumented low level terrain following course and aircraft gun system harmonization range (GUN BUTT).

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	1.564	1.564
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	1.491	1.552
TOTAL ANNUAL LAB	3.055	3.116
TOTAL INHOUSE	3.055	3.116
TOTAL INHOUSE RDT&E	1.564	1.564
ANNUAL OPERATING COST	0.325	2.204

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	23	12	14	9
CIVILIAN	9	2	2	7
TOTAL	32	14	16	16

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
0	16.956	1.849	0.000	18.805	1.923	4.814

MISSION

Conduct basic research in lasers, aeromechanics and chemistry. Encourage and support U.S. Air Force academy faculty and cadet research by direct participation. Sponsor independent faculty research.

CURRENT IMPORTANT PROGRAMS

Electrochemistry of molten salts (battery research).
Energetic materials, synthesis and decomposition mechanics.
Theoretical chemical calculations.
Laser (nonlinear optics, kinetics.)
Unsteady aerodynamics and large space structures.

FUNCTIONS/EQUIPMENT/FACILITIES

Molten salt melt structure (MSMT), conductivity and electrode reactions, explosive and propellant synthesis, decomposition mechanics and detonation phenomena. MSMT generation, spectroscopy and molecular calculations of molecular species. FTIR, UV, FTNME, EPR, mass specifications, chromatographs, electron microscope, special spectrometers and conductivity equipment. Full wet laboratory. Laser laboratories for nonlinear optics and kinetics experiments. Subsonic wind tunnel and data collection equipment, including mass comparison for unsteady aerodynamics research. Pressure, hot wire and flow visualization capabilities and associated instrumentation for wind tunnel experiments. One-dimensional truss and two-degree of freedom structure with close coupled vibration modes. Modal analysis equipment for control of flexible structure vibration experiments.

GEOPHYSICS LABORATORY**BEDFORD, MA****CDR: COL. ROBERT J. HOVDE****CH SCI DIR: DR. RICHARD HENDL**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	107.436	120.168
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	4.454	5.365
TOTAL ANNUAL LAB	111.890	125.533
TOTAL INHOUSE	42.156	43.035
TOTAL INHOUSE RDT&E	37.982	37.950
ANNUAL OPERATING COST	12.388	12.884

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	103	3	40	63
CIVILIAN	452	96	241	211
TOTAL	555	99	281	274

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
336	395.732	14.281	25.883	435.896	12.350	53.995

MISSION

Conducts and supports Air Force relevant research and advanced development in environmental and physical sciences with major emphasis on geophysics and interactions between systems and their environment. Also conducts and supports specifically Assigned development efforts.

CURRENT IMPORTANT PROGRAMS

Space effects on Air Force systems.
 Weather impact on Air Force mission.
 Ionospheric effects on Air Force systems.
 Optical and infrared technology.
 Terrestrial effects on Air Force systems.

FUNCTIONS/EQUIPMENT/FACILITIES

Conducts research and technical development in terrestrial and atmospheric sciences including ionospheric, optical, space and solar physics relating to Air Force needs. Includes space weather specifications and forecasting and IR signature and background models for surveillance system design. Equipment and facilities include in-house laboratories, space simulation chambers, rocket and balloon launch facilities, and two KC-135 aircraft for optical, upper atmospheric, and ionospheric studies.

HUMAN RESOURCES LABORATORY**BROOKS AFB, TX****CDR: COL. HAROLD G. JENSEN**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	49.409	55.143
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	1.491	1.570
TOTAL OTHER	0.000	0.000
TOTAL ANNUAL LAB	50.900	56.713
TOTAL INHOUSE	13.238	15.618
TOTAL INHOUSE RDT&E	13.212	15.598
ANNUAL OPERATING COST	2.872	2.981

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	162	4	80	82
CIVILIAN	208	47	119	89
TOTAL	370	51	199	171

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
5	99.348	77.862	51.057	228.267	15.257	126.528

MISSION

Plan and execute research, exploratory, and advanced development programs in training, logistics, manpower and force management.

CURRENT IMPORTANT PROGRAMS

Manpower and force management: selection, classification, retention, manpower personnel and training requirements. Training: flight simulation, visual simulation requirements, computer based instruction, training management, job performance measurement and artificial intelligence. Logistics: combat maintenance, automated technology information, concurrent engineering and ground operations research.

FUNCTIONS/EQUIPMENT/FACILITIES

Research in selection and classification testing, occupational analysis. Development of technologies for manpower management, job performance measurement, training, planning and evaluation. Development and training effectiveness assessment of flight training simulators and their visual displays. Research in computer based instruction. Application of artificial intelligence to training and job aiding. Development of computer aids to incorporate reliability and maintainability in initial weapons systems designs. Investigation into automating the development, transfer, and display of weapons system technical data. Basic research in the theories of mental aptitudes, learning ability, and perceptual dimensions of pilot behavior. Quick reaction studies of questions posed by Air Force manpower and personnel management offices.

MATERIALS LABORATORY**WPAFB, OH****DIR: DR. VINCENT J. RUSSO****CH SCI DIR: DR. HARRIS M. BURTE**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT + EST)
TOTAL RDT&E	183.707	210.921
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	1.941	2.044
TOTAL ANNUAL LAB	185.648	212.965
TOTAL INHOUSE	26.119	28.846
TOTAL INHOUSE RDT&E	24.178	26.802
ANNUAL OPERATING COST	1.083	1.080

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	380	4	39	341
CIVILIAN	247	57	199	48
TOTAL	627	61	238	389

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
15	217.785	0.549	159.438	377.772	277.216	34.000

MISSION

Plan and execute research and development programs for materials. Provide technical and management assistance in system studies, analysis, development planning, test, evaluation, modification and operation of aerospace systems.

CURRENT IMPORTANT PROGRAMS

Structural materials for aerospace systems.

Propulsion materials.

Electronic materials.

Laser hardened materials.

FUNCTIONS/EQUIPMENT/FACILITIES

Materials research and development facilities and capabilities for aerospace structures including thermal protection systems, propulsion materials, fluids, lubricants, fluid containment, coatings, fibers, sensors, superconductors, nonlinear optics, electrical components, nondestructive evaluation, computed tomography, polymers, molecular composites, nonmetallic matrix components, elastomers, metals, alloys, metal matrix composites, metal processing, ceramics, intermetallics, static and dynamic behavior. Electronic/physical/chemical analysis, failure analysis, computer-aided manufacturing, powder metallurgy, and other major materials functions which include manufacturing technology, systems applications and systems support.

ROME AIR DEVELOPMENT CENTER
GRIFFISS AFB, NY
CDR: COL ROBERT L. RHAME
CHIEF SCIENTIST: DR. FRED DIAMOND

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	297.940	266.529
TOTAL PROCUREMENT	13.034	8.465
TOTAL O&M	44.543	41.152
TOTAL OTHER	9.478	9.667
TOTAL ANNUAL LAB	364.995	325.813
TOTAL INHOUSE	62.563	57.358
TOTAL INHOUSE RDT&E	46.181	41.312
ANNUAL OPERATING COST	2.220	2.313

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	177	8	117	60
CIVILIAN	1,069	63	626	443
TOTAL	1,246	71	743	503

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LA^R	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
1,552	570.374	46.247	418.071	1,034.692	93.803	152.241

MISSION

Rome Air Development Center plans and executes research, development, test and selected acquisition programs in support of command, control, communications and intelligence (C3I) activities. Technical and engineering support within areas of technical competence is provided to ESD program offices (POS).

CURRENT IMPORTANT PROGRAMS

Photonics.
Low observables.
Battle information management and decision aids.
Computational science and software engineering.
Electro-optical surveillance and devices.

FUNCTIONS/EQUIPMENT/FACILITIES

Rome Air Development Center, Griffiss AFB has operating locations at: Hanscom Air Force Base (2 directorates); Ava, NY; Ontario, NY; Verona, NY; Newport, NY; Stockbridge, NY; Youngstown, NY; Forestport, NY; Quacker Hill, NY; Vienna, NY; Ipswich, MA; Prospect Hill, MA. In-house facilities: reconnaissance exploration facility, photonics center, reliability analysis center, experimental photogrametric facility, ECCM and signal processing laboratory, solid state device failure analysis facility, command and control technology laboratory, radiation effects facility, electro-magnetic vulnerability facility, surveillance laboratory, materials synthesis and development facility, and experimental device fabrication facility.

SCHOOL OF AEROSPACE MEDICINE**BROOKS AFB, TX****CDR: COL(DR) GEORGE E. SCHWENDER CHIEF SCIENTIST: DR. R.R. BURTON**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	24.399	26.899
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	5.400	4.723
TOTAL OTHER	22.507	0.000
TOTAL ANNUAL LAB	52.306	31.622
TOTAL INHOUSE	43.601	21.929
TOTAL INHOUSE RDT&E	15.694	17.206
ANNUAL OPERATING COST	2.615	2.723

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	313	42	86	227
CIVILIAN	270	44	109	161
TOTAL	583	86	195	388

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
1,309	224.672	86.078	422.839	733.589	54.174	29.102

MISSION

Practice, teach, advance and apply the principles of aerospace medicine. Aerospace medicine is the discipline in the life sciences which addresses the selection, protection, performance and maintenance of humans in the aerospace environment.

CURRENT IMPORTANT PROGRAMS

Chemical warfare defense.
Electromagnetic radiation and directed energy bioeffects.
Crew readiness and protective equipment.
Aeromedical aspects of aerospace operations.
Human centered systems research.

FUNCTIONS/EQUIPMENT/FACILITIES

RDT&E on crew protective equipment and systems: human centrifuge, research environmental simulators, spatial orientation training device/human performance testing laboratory, cockpit integration laboratory and chemical defense test facility. Research on effects and applications of electromagnetic radiation in aerospace operations: radio-frequency radiation research facility, directed energy bioeffects laboratory, laser bioeffects facility, laser range and animal-to-man extrapolation facility. Research on medical selection, care and retention of flying personnel; cardiac cath lab, aerospace medical science lab, psychobiology, nuclear medicine data acquisition system, optical, audiology, and vestibular labs. Support facilities: aeromedical library and biomedical animal research.

WEAPONS LABORATORY (AFSC)**KIRKLAND AFB, NM****CDR: COL PETER MARCHIONDO****CH SCI DIR: DR. JOSEPH JANNI**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1989 (Actual)	1990 (ACT+EST)
TOTAL RDT&E	248.795	0.000
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.031	0.000
TOTAL OTHER	24.905	0.000
TOTAL ANNUAL LAB	273.731	0.000
TOTAL INHOUSE	143.213	0.000
TOTAL INHOUSE RDT&E	118.277	0.000
ANNUAL OPERATING COST	4.933	0.000

PERSONNEL DATA (END OF FY 1989)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	479	28	367	112
CIVILIAN	559	61	249	310
TOTAL	1,038	89	616	422

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
90	603.560	235.002	159.354	997.916	114.247	88.000

MISSION

Responsible for research and development activities in space and missile technology, directed energy weapons technology, survivability and hardening of spacecraft and other systems, and geophysics technology.

CURRENT IMPORTANT PROGRAMS

Directed energy weapon technology.
 Space and missile technology.
 Nuclear vulnerability and hardening technology.
 Geophysics technology.
 Strategic Defense Initiative.

FUNCTIONS/EQUIPMENT/FACILITIES

Many activities are conducted in engineering and physics laboratories. Specialized facilities exist for experiments using electromagnetic pulse simulators, gas guns and X-ray devices. Directed energy developments use laser devices, laser optics laboratories and ranges and high power microwave laboratories. Space and missile facilities include rocket test stands.

CDR: COL DAVID M. PHILLIPS

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	95.958	92.276
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.131	0.067
TOTAL OTHER	29.712	31.722
TOTAL ANNUAL LAB	125.801	124.065
TOTAL INHOUSE	97.281	106.892
TOTAL INHOUSE RDT&E	67.569	75.170
ANNUAL OPERATING COST	0.000	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	847	1	152	695
CIVILIAN	829	0	142	687
TOTAL	1,676	1	294	1,382

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
400	22.012	129.973	741.409	893.394	27.070	210.000

MISSION

Flight test of aircraft systems, subsystems and components, worldwide Airborne Research and Test support (ARIA). Testing Commercial Aircraft for Military Applications (TCAMA) aircraft modification, design, fabrication, installation and limited manufacturing support.

CURRENT IMPORTANT PROGRAMS

Air Force One.
Mark XV IFF.
ARGUS.
Central Inertial Guidance Test Facility (CIGTF).
Big Crow.

FUNCTIONS/EQUIPMENT/FACILITIES

Precision Measurement Equipment Laboratory (PMEL). Specialized and quick response fabrication/modification equipment facility. Computer Aided Design/Manufacturing (CAD/CAM) capability. Advanced Range Instrumentation Aircraft (ARIA) electronic counter-countermeasures/advanced radar test bed. ARIA scoring systems advanced Cruise Missile Mission Control Act (CMMCA). Integrated Data Facility (IDF). Logistics Material Control Activity (LMCA). Temporary/prototype aircraft modification facility. DEC VAX computer system. 2000 square mile restricted test area in southwest Ohio.

6585 TEST GROUP**HOLLOMAN AFB, NM****CDR: COL RONALD C. HOOVER**

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	49.867	45.925
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	7.722	6.960
TOTAL OTHER	9.333	7.974
TOTAL ANNUAL LAB	66.922	60.859
TOTAL INHOUSE	47.226	42.909
TOTAL INHOUSE RDT&E	37.893	34.935
ANNUAL OPERATING COST	0.078	0.074

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	247	1	86	161
CIVILIAN	302	1	62	240
TOTAL	549	2	148	401

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
7,052	407.068	39.081	93.979	540.128	228.352	151.966

MISSION

DOD focal point for flight, laboratory and sled T&E of inertial guidance systems. High speed testing for seat ejection, impact, and guidance systems. Radar cross section and antenna measurement of space vehicles, RVS, aircraft support of in-house and transients.

CURRENT IMPORTANT PROGRAMS

B1-B Avionics.
B-52 GPS Integration.
Short Range Attack Missile (SRAM)-II.
Multiple Launch Rocket System (MLRS).
Inertial Guidance System and Components Testing.

FUNCTIONS/EQUIPMENT/FACILITIES

One 260-inch, one 120-inch, one 100-inch precision centrifuge. Precision reference/data collection (electronic/photographic). Environmental chambers (temperature/altitude), inertial navigation vans, scientific ADPE. 50,799 ft dual-rail test track, 5 blockhouses 9,000 ft rainfield, 2,000 ft ballistic rainfield, 150mhz to 95ghz RCS measurement, antenna pattern measurement R&D machine/fabrication shop, model making.

DEFENSE NUCLEAR AGENCY

CDR: COL GEORGE W. IRVING III

PROGRAM DATA BY FISCAL YEAR (MILLIONS \$)		
PROGRAM	1990 (Actual)	1991 (ACT+EST)
TOTAL RDT&E	16.307	0.000
TOTAL PROCUREMENT	0.000	0.000
TOTAL O&M	0.000	0.000
TOTAL OTHER	3.900	0.000
TOTAL ANNUAL LAB	20.207	0.000
TOTAL INHOUSE	16.360	0.000
TOTAL INHOUSE RDT&E	16.307	0.000
ANNUAL OPERATING COST	3.626	0.000

PERSONNEL DATA (END OF FY 1990)				
PERSONNEL	AUTHORIZED STRENGTH	TOTAL PHDS	TOTAL PROF	NON- PROF
MILITARY	86	19	51	35
CIVILIAN	199	54	114	85
TOTAL	285	73	165	120

SPACE AND PROPERTY						
ACRES	SPACE (THOUSANDS OF SQUARE FEET)				COST (MILLIONS \$)	
	LAB	ADMIN	OTHER	TOTAL	REAL PROP.	EQUIP.
10	61.750	31.057	24.901	117.708	0.000	19.600

MISSION

The mission of Armed Forces Radiobiology Research Institute shall be to conduct research in the field of radiobiology and related matters essential to the operational and medical support of the Department of Defense and military services. The biomedical research program is directed toward acquiring the quantitative and qualitative data necessary for assessing the effects of radiation on man.

CURRENT IMPORTANT PROGRAMS

Define physiological/pathological response in humans to radiation.
Assess effects of combined injuries, military forces/noncombatants.
Data for prediction of combat ineffectiveness and casualty production.
Treatment methods for casualties from radiation/combined injury.
Instruction to Armed services on treatment of nuclear casualties.

FUNCTIONS/EQUIPMENT/FACILITIES

Functions: operate facilities for conducting radiobiology research and disseminating results. Conduct advanced training: provide analysis consultation on bioeffects of radiation and perform other such research functions as required. Major equipment includes: pulse and steady state nuclear reactor, 300,000-Curie Cobalt-60 irradiator, electron linear accelerator, X-ray, theratron exposure capability and electron microscope. Support services include: measurement of radiation fields, provision and care of laboratory animals, equipment design and fabrication assistance, real-time data acquisition system, television and film documentation of experiments, personnel and environmental monitoring, editorial assistance in report preparation, and a large technical library.

APPENDIX I
DISESTABLISHMENT, ESTABLISHMENT,
OR CHANGES IN ORGANIZATION NAME

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DISESTABLISHMENT, ESTABLISHMENT, OR CHANGES IN ORGANIZATION OR NAME

DEPARTMENT OF THE ARMY

Aviation Development Test Activity, Ft Rucker, AL - On 1 Oct, 1990 the Aviation Development Test Activity (ADTA) was reorganized and renamed the Aviation Technical Test Center (ATTC).

Aviation Engineering Flight Activity, Edwards AFB, CA - On 1 Oct, 1990 the Aviation Engineering Flight Activity (AEFA) was consolidated under the Aviation Technical Test Center (ATTC) and has been renamed the Airworthiness Qualification Test Directorate.

Aviation Research & Technology Activity, Moffett Field, CA - In December 1989 the Aviation Research & Technology Activity (ARTA) was disestablished. Staff and property remain a part of the Aviation Systems Command.

Aviation Systems Command, St Louis, MO - In 1990 the Aviation Systems Command Headquarters first qualified for inclusion in this report.

DEPARTMENT OF THE NAVY

Ocean Research and Development Center, Bay St Louis, MS - In 1990 the Ocean Research and Development Center was renamed the Oceanographic and Atmospheric Research Laboratory.

DEPARTMENT OF THE AIR FORCE

Eastern Space and Missile Center, Patrick AFB, FL - This installation does not meet the RDT&E funding criteria for the FY90 In-House report.

Western Space and Missile Center, Vandenberg AFB, CA - This installation does not meet the RDT&E funding criteria for the FY90 In-House report.

DEPARTMENT OF DEFENSE AGENCIES

NONE

APPENDIX II
DEFINITIONS OF REPORT ELEMENTS

APPENDIX II

DEFINITIONS OF REPORT ELEMENTS

Annual Operating Cost - This reflects the overhead cost of operating the laboratory or facility. It includes costs such as utilities, rents, janitorial services, guard and fire protection, support services such as supply personnel, printing, maintenance of buildings and grounds, etc. It does not include the salaries of direct labor personnel such as scientists, engineers, technicians, draftsmen, machinists, etc.

Equipment Cost - Each reporting activity is responsible for determining and reporting the cost of personal property. This cost is established in accordance with the guidelines and definitions in DoD Instruction 4165.14. This also includes the cost of installed equipment.

In-House Obligations - Obligations reported under this category are for activities performed, or to be performed, by the organizational entity. Their work is carried on directly by their own personnel. This also includes under in-house performance the cost of supplies and equipment essentially of an off-the-shelf nature that are procured for use in in-house research and development, plus such things as travel, publications, and other types of services in support of in-house functions and M.P.A. Excluded from the in-house total are expenses for planning and administering programs by DoD personnel of contracts and grants for out-of-house work and M.C.A.

In-House RDT&E Activities - Those organizational entities performing work in any or all of the categories of research, development, test, and evaluation. The RDT&E effort, however, should represent a minimum of 25 percent of the total effort of each entity reporting in order to be considered as an RDT&E activity.

Obligational Authority - Authority for the financial resources available for obligation of the specific year being reported. This includes unobligated authority carried forward from the prior year and all obligational authority received or made available for obligation in the year being reported, including the unobligated authority which will be carried forward into the following year.

Out-Of-House Obligations - Obligations reported under this category are for activities performed, or to be performed, by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions, and private individuals. Included as out-of-house work are all expenses paid the out-of-house performers, as well as the expenses incurred in planning and administering these programs by personnel of the organizational entity. This would also include travel and other supporting services.

Professionals - Full-time government scientific and engineering personnel actively engaged in RDT&E activities. In the case of civilians this includes all those holding positions that fall into the following categories under the Civil Service Occupational Groups and Series or Classes, General Schedule:

101 Social Science	437 Horticulture
150 Geography	440 Genetics
180 Psychology	454 Range Conservation
184 Sociology	457 Soil Conservation
190 General Anthropology	460 Forestry
193 Archeology	470 Soil Science
401 Ecology	471 Agronomy
403 Microbiology	480 General Fish & Wildlife
405 Pharmacology	482 Fishery Biology
408 Ecology Engineering	486 Wildlife Biology
410 Zoology	487 Animal Science
413 Physiology	493 Home Economics
414 Entomology	601 General Health
430 Botany	602 Medical Officer
434 Plant Pathology	660 Pharmacist
435 Plant Physiology	662 Optometrist Examining
436 Plant Protection and Quarantine	665 Speech Pathology and Audiology
668 Podiatrist	1222 Patent Attorney

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690 Industrial Hygiene	1224 Patent Examining
695 Food and Drug Officer	1225 Patent Interference
696 Consumer Safety	Examining
701 Veterinary Medical	1226 Design Patent Examining
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801 General Engineering	1306 Health Physics
803 Safety Engineering	1310 Physics
804 Fire Prevention	1313 Geophysics
Engineering	1315 Hydrology
806 Materials Engineering	1320 Chemistry
807 Landscape Architecture	1321 Metallurgy
808 Architecture	1330 Astronomy and Space Science
810 Civil Engineering	1340 Meteorology
819 Sanitary Engineering	1350 Geology
830 Mechanical Engineering	1360 Oceanography
840 Nuclear Engineering	1370 Cartography
850 Electrical Engineering	1372 Geodesy
855 Electronic Engineering	1380 Forest Products
858 Biomedical Engineering	1382 Food Technology
861 Aeronautics Engineering	1384 Textile Technology
871 Naval Architecture	1386 Photographic
880 Mining Engineering	Technology
881 Petroleum Engineering	1510 Actuary
890 Agriculture Engineering	1515 Operations Research
892 Ceramic Engineering	1520 Mathematics
893 Chemical Engineering	1529 Mathematical
894 Welding Engineering	Statistician
896 Industrial Engineering	1530 Statistician
1221 Patent Adviser	1540 Cryptography
	1550 Computer Science

Military professional, both officer and enlisted, actively engaged in RDT&E activities are identified with the functions described in the above referenced civilian job series. Lawyers, accountants, chaplains, social workers, and educators should be excluded.

Real Property Cost - Each reporting activity is responsible for determining and reporting the cost of real property. This cost is established in accordance with the guidelines and definitions in DoD Instruction 4165.14. This also includes the cost of installed equipment.

RDT&E - Research, Development, Test and Evaluation

Space - This data includes only walled and roofed building space. It does not include such things as parking lots, open storage areas, lean-tos, etc. This data is established in accordance with the guidelines and definitions in DoD Instruction 4165.14.

Technicians - Generally non-professionals working on an RDT&E project or program in support of a professional. In the case of civilians, it includes, but is not necessarily limited to, those holding positions that fall into the following categories of the Civil Service Occupational Groups and Series of Classes, General Schedule:

102 Social Science Technician	455 Range Technician
181 Psychological Technician	458 Soil Conservation Technician
404 Biological Technician	462 Forestry Technician
421 Fire Protection Technician	693 Physician Assistant
621 Nurse Assistant	684 Public Health

APPENDIX II

DEFINITIONS OF REPORT ELEMENTS

622 Medical Supply Aid	688 Sanitarian
625 Autopsy Attendant	698 Environmental Health Technician
636 Rehabilitation Therapy Asst	699 Health Technician
642 Nuclear Medicine Technician	704 Animal Health
644 Medical Technologist	802 Engineering Technician
645 Medical Technician	817 Surveying Technician
646 Pathology Technician	818 Engineering Drafting
647 Medical Radiology Technician	856 Electronics Technician
648 Therapeutic Radiological Technologist	895 Industrial Engineering Technician
649 Medical Machine Technician	1202 Patent Technician
650 Medical Technical Assistant	1311 Physical Science Technician
661 Pharmacy Technician	1316 Hydraulic Technician
664 Restoration Technician	1341 Meteorological Technician
667 Orthotist and Prosthetist	1371 Cartographic Aid
669 Medical Record Librarian	1374 Geodetic Technician
681 Dental Assistant	1521 Mathematics Technician
682 Dental Hygienist	1531 Statistical Clerical & Administrative
683 Dental Laboratory Technician	1541 Cryptoanalysts

The number of military technicians is determined according to the guidelines established in defining civilian technicians as identified in DoD 1312.1-E.

Total Annual Lab - The sum of Total RDT&E, Total Procurement, Total O&M and Total Other

Total In-House - The sum of only the In-House portions of Total RDT&E, Total Procurement, Total O&M and Total Other.

Total In-House RDT&E - The total obligational authority, regardless of source, for only the In-House portion of Total RDT&E.

Total O&M - The total obligational authority for both In-House and Out-of-House Operations and Maintenance Appropriations regardless of source.

Total Other - The total obligational authority for both In-House and Out-of-House Appropriations, regardless of source, which are not reported elsewhere.

Total Procurement - The total obligational authority for both In-House and Out-of-House Procurement Appropriations regardless of source.

Total RDT&E - The total obligational authority, regardless of source, for both In-House and Out-of-House funding for the following categories:

- Research 6.1
- Exploratory Development 6.2
- Advanced Development 6.3A
- 6.3B
- Engineering Development 6.4
- Management Support 6.5
- Operational Systems Support
- All Other RDT&E Funding

APPENDIX III

SELECTED STANDARD ABBREVIATIONS AND ACRONYMS

APPENDIX III

SELECTED STANDARD ABBREVIATIONS AND ACRONYMS

AAM	- Air-to-Air Missile	HF	- High-Frequency
AAW	- Antiair Warfare	IFF	- Identification, Friend or Foe
ADPE	- Automatic Data-Processing Equipment	IR	- Infrared
AEDC	- Arnold Engineering Development Center	MPT	- Military Potential Test
AFSC	- Air Force Systems Command	NAF	- Naval Air Facility
AFWET	- Air Force Weapons Effectiveness Testing	NASA	- National Aeronautics and Space Administration
AMC	- US Army Materiel Command	NASC	- Naval Air Systems Command
APG	- Aberdeen Proving Ground	NAVAIR	- Naval Air Systems Command
ASW	- Antisubmarine Warfare	NAVSEA	- Naval Sea Systems Command
AUS	- Army United States	NEMP	- Nuclear Electromagnetic Propagation
BIS	- Board of Inspection and Survey	PI	- Product Improvement
BW	- Biological Warfare	POL	- Petroleum, Oil, Lubricants
CBR	- Chemical, Biological Radiological	QA	- Quality Assurance
CE	- Chief of Engineers Army	QMDO	- Qualitative Material Development Objective
CG	- Commanding General	RDT&E	- Research, Development, Test and Evaluation
CNO	- Chief of Naval Operations	RF	- Radio Frequency
COMMEL	- Communications Electronics	RV	- Reentry Vehicle
DA	- Department of the Army	SATS	- Short Airfield Tactical Support
DARPA	- Advance Research Projects Agency	SDI	- Strategic Defense Initiative
DOD	- Department of Defense	SDR	- Small Development Requirement
DZ	- Drop Zone	SI	- Ship Installation
ECM	- Electronic Countermeasures	SP	- Self Propelled
ED	- Engineering Development	ST	- Service Test
EDT	- Engineering Development and Test	T&E	- Test and Evaluation
EEG	- Electroencephalogram	TOA	- Total Obligational Authority
EKG	- Electrocardiogram	UDT	- Underwater Demolition
ELINT	- Electronic Intelligence	ULMS	- Undersea Long-Range Missile System
EMP	- Electromagnetic Propagation	USATECOM	- US Army Test & Evaluation Command
EMW	- Electromagnetic Warfare	UTTAS	- Utility Tact Transport Aircraft System
EODC	- Explosive Ordnance Disposal Center	USW	- Undersea Warfare
ET	- Engineering Artillery	UV	- Ultraviolet
FA	- Field Artillery	V/STOL	- Vertical/Short Takeoff and Landing
FBM	- Fleet Ballistic Missile		
GCA	- Ground-Controlled Approach		

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